IN THIS ISSUE: Electrical Opportunities in the Pan-Pacific Countries

JOURNAL OF ELECTRICITY

VOL. 43 NO. 9 SAN FRANCISCO, NOVEMBER 1, 1919 PER COPY, 25 CENTS

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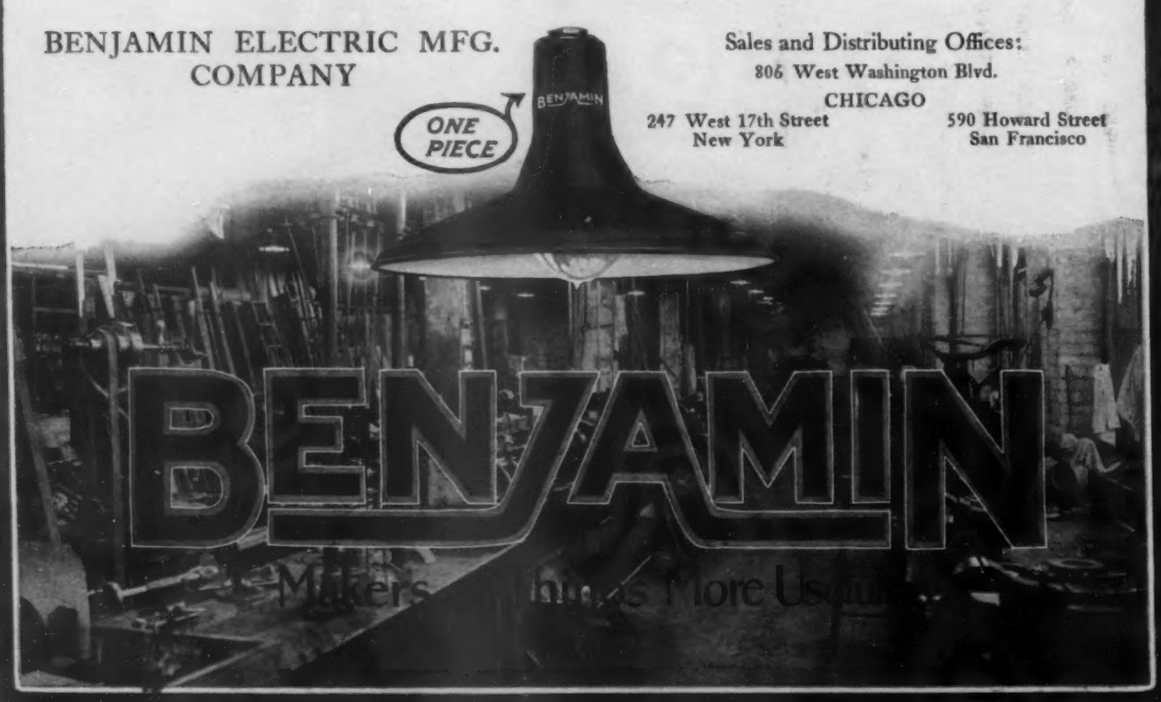

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ROBERT SIBLEY, Editor

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FOREIGN TRADE CONVENTION, 1920

The year 1920 will be a significant one for the electrical and engineering interests of the Western coast of the United States and of the great countries which border the Pacific. On May 12-15 of that year the Foreign Trade convention, which is the important event of the international commercial year, will convene in San Francisco. Special ships are to be run from the various important Pan-Pacific ports, bringing representatives to this convention, and the Journal of Electricity throughout the year will feature articles of commercial and engineering interest to those who are engaged in the development of the Pan-Pacific area and in promotion of this great convention in 1920. The important position which the West is to take in the Pan-Pacific commerce of the next few years is in large measure dependent upon the development of its electrical resources which will shortly make possible extensive manufacturing enterprises to care for the raw materials of our Pan-Pacific neighbors. The problems of the West and of the developing region of the Pacific are in much so similar that they are drawn closely together in cordial cooperation. The beautiful Civic Auditorium of San Francisco, here shown as it was electrically flood-lighted on the occasion of the recent California Land Show, will probably be the scene of this great convention where the West will welcome the representatives of American industry who gather more firmly to cement the friendly commercial and engineering relations between America and our foreign neighbors.

JOURNAL OF ELECTRICITY

DEVOTED TO THE UPBUILDING OF THE ELECTRICAL INDUSTRY IN THE WEST AND IN THE COUNTRIES BORDERING THE GREAT PACIFIC

Volume 43 | SAN FRANCISCO, NOVEMBER 1, 1919 | Number 9

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Without Vision the People Perish

IT is questionable if ever since the world began an industry offered such constructive vision to tired humanity as the vision of usefulness to the human race offered by men of the electrical industry today. The fires electrical kindled during hours of peril saved freedom to the world and its peoples by means of the method electrical in every sinew of war.

Are you in these thrilling days of readjustment keeping your own individual vision of bigger things before you at all times—a vision so all-encompassing as to banish the fear of making mistakes, the fear that would urge you not to attempt the bigger idea or the fear of criticism that may come from your fellows in case of failure?

With the bigger vision of usefulness ever before you courage comes, and never can it be said of our wonderful industry, "Without vision the people perish."

David P. Barrows for University President

To the electrical industry in the West—vibrating with possibilities of development during the next score of years to a degree hitherto unexperienced in the accomplishments of industry — the matter of strong and sound leadership in Western Universities is of great present concern.

Seven months have elapsed since the Journal of Electricity in its leading editorial of March 15, 1919, entitled "The University President—What Is Needed," pointed out in an impersonal manner the crying need for broad action in the matter of the selection of a man for the presidency of the University of California. Perhaps no editorial of the Journal of Electricity in recent years has received the widespread attention that has been accorded this particular editorial. Not only have a substantial number of our readers endorsed as individuals the broad sentiments expressed in the editorial, but engineering societies and local sections of national engineering societies have gone on record in favor of this editorial and its suggestions.

Through the months that have elapsed a crystallization of sentiment has been taking place regarding the man for this position. The result of this thought is being expressed on all sides. Briefly summarized it may be stated in the following words: Due consideration has been given to candidates from neighboring universities and men of the East. Local candidates have been carefully considered and when the final estimate is made of the best available man attention is being centered on David P. Barrows, of the University of California.

And why should not Dr. Barrows be the one man for the position? Here are the fundamental conceptions of our former editorial that have won such wide endorsement:

"The man to undertake such a task as that of the presidency of the University of California must be one familiar with the ideals of the Eastern civilization, yet whose very heart-throbs pulsate with the life-giving energies of our great West and what it has in its native values to offer of helpfulness to humanity. He must be a man of courage—a man of conviction—a man of vision—such characteristics may indeed be said to make up the scholar in the highest sense of the word."

To see how well Dr. Barrows measures up to these lofty requirements we have only to follow him again in his work at Pomona College, at California and at Columbia as a student, in the Philippines and Mexico as an educator, in the president's chair at Berkeley as acting president of the University of California, in the cause of humanity as a member of the Commission for Relief in Belgium, and again on the field of battle in the wilds of Siberia—as a soldier fighting in the cause of world freedom.

Finally, if there is a shadow of a doubt in your mind, hear him in one of his masterly expositions of the perils of the hour show how we must as citizens manfully face them, such as he recently delivered before thousands of California teachers in the Oakland Auditorium, and you will lose every possible sense of doubt that he, Dr. David P. Barrows, is the man of the hour for the presidency of the University of California.

Pan-Pacific Engineering Congress at Java

Of vast significance is the Pan-Pacific Engineering Congress to be held at Weltevreden, near Batavia, Java, in May, 1920. This gathering of technical experts from all lands washed by the waters of the Pacific may well mark an epoch in the development of the Orient—for it is to the engineering problems of the Far East, particularly, that attention is to be devoted. That this will be an assemblage truly representative of the whole Pan-Pacific area may be judged from the assurance that delegates will attend from India, Japan, China, Australia, the United States and a score of other countries. Widespread interest is indicated by the fact that a full year before the opening date of the congress no less than 170 papers had been submitted on Asiatic engineering problems. The papers will be discussed in six main sections, and one important division relates to "industry and the production of energy." The scope of the conference, as shown by the published program, is very comprehensive; it ranges from water supply and radio telegraphy to aerial navigation and the study of volcanic phenomena.

With governmental support, and under the active management of the Netherlands Indies section of the Royal Dutch Institute of Engineers, the congress from the start appears assured of every success. Attendance at the gathering will not only mean access to a new and almost limitless field of engineering endeavor; it will give opportunity also to visit Siam, Straits Settlements, the Philippines, Ceylon, India and other interesting countries of the Orient. Java itself is one of the most entrancing of Pacific lands, and not only its majestic scenery and its jungle-covered ruins of antiquity, the work of master builders, will arouse the visitor to enthusiasm. Throughout the Malay archipelago there are signs of an awakening to tremendous industrial development, of the kind which appeals most strongly to the constructive imagination of the American engineer.

Forecasting all this, P. A. Roelofsen, Chief Manager of the Government Hydro-Electric Service of the Netherlands Indies, arrives in San Francisco early this month to make an inspection tour of industrial America. He is sent across seas to study water power developments, electric railroads, nitrogen industries and electric furnaces, especially those for the smelting of iron ore. This eminent technical authority will no doubt have much momentous data to lay before the engineering conference at Java, where the proceedings will be held in Dutch and in English—the great trade language of the Pan-Pacific area.

Trade Missions are Missing the West

Never has America been so much visited as in this first busy year after the World War. Distinguished guests have crowded to our shores; we have even been privileged to welcome a royal entourage from heroic Belgium. Of particular significance have been the visitations by commercial and industrial missions from the war-torn European countries. At the end of October a grand World Trade convention was held at Atlantic City, where American business men met together with eminent representatives of Britain, France, Italy and Belgium. All of these countries have immense industrial problems confronting them, both at home and in their dependent territories. France and Italy from now on will be obliged to produce more hydroelectric power because of the serious shortage of coal; Belgium must undertake vast new developments in the rich realm of the Congo to recoup domestic losses; Britain appears everywhere eager to expand her industrial system. Never was Europe in a more inspired frame of mind for gigantic engineering projects; the reclamation of the Zuyder Zee and the delving of the Channel Tunnel at last seem about to become realities.

It is to be regretted, therefore, that the delegates from abroad fail to visit our great Western states, where engineering enterprise is triumphing over obstacles such as the war-zone countries must also conquer in their reconstruction. Announcement has been made that the distinguished visitors will make a tour of "the industrial sections of North America," yet their program as outlined takes them no farther from Atlantic City than St. Louis. Unless their plans are changed, they are not to see the hydroelectric developments, the mines, the aqueducts nor the oil-fields of the West. Truly it is to be hoped that some at least of these visitors will be enabled to come to the Pacific Coast to observe these things.

A party of more than 200 commercial delegates from Switzerland, representing "The Swiss Mission for Economic Studies in North America," has recently completed a month's tour of various manufacturing establishments in this country—yet only one solitary delegate, to our knowledge, wandered to Pacific shores. In view of the immense dependence of Swiss manufactures upon water power, it would seem that the Swiss leaders of industry could find much of profit and interest in the hydroelectric developments throughout the West.

King Albert we have seen and greeted as a royal good fellow; and as ready a welcome is awaiting the business barons of Europe who shall choose to visit us. Our invitation goes out to them, "Come over across the Rockies." The West feels that it has much to offer; and for advice as to the wide extent of these offerings, Europe is referred to its friend Herbert Hoover—the most typical engineer of the West.

The Mecca for Advanced Thought

The electrical industry in the West finds itself today emerging from war activities to assist in problems of world readjustment in a situation so favorable as to mark this section of our nation as a leader in advanced thought in matters electrical. Vast transmission lines which stretch with record breaking voltages from Harlowton, Montana, on westward across Idaho, Washington and southern through Oregon and California to the Mexican border line—a distance of over two thousand miles—tell but faint words of this accomplish-

ment and the many record-breaking feats that have thus been brought about.

But with this triumph in engineering accomplishment along physical lines—an accomplishment that has brought about a per capita use of electricity not even approached anywhere else in the world—there is today developed a vision in men of this district that is giving to the nation a helpfulness of the most timely and constructive nature.

The geographic section idea is here being worked out in an unusually helpful and efficient manner by the Pacific Coast Section, N. E. L. A., and the Northwest Electric Light and Power Association. Some conception of this efficient work may be gathered from other pages of this issue.

The California Electrical Cooperative Campaign has accomplished new attainments in bringing about a helpful and united industry in its internal relationship and in its open and frank dealing with the public.

Commission regulation, too, such as that of the California Railroad Commission, is proving broad-visioned and a stabilizing factor in utility securities.

Public Policy, under such able national leadership as that of John A. Britton of the Pacific Gas & Electric Company, is reaching all parts of the nation today in its helpful influence.

Executive administration of a great national electrical body under the presidency of R. H. Ballard, of the Southern California Edison Company, is indeed awakening new interest in every nook and corner of the nation.

There is just one way men of the nation can check up all of this splendid work and that is to come West next spring and plan to attend some one or all of the following big conventions: The World Foreign Trade Convention at San Francisco in April; the National Electrical Supply Jobbers' Association at Del Monte, California, in May; or the National Electric Light Association convention at Los Angeles in May. The eyes of the nation are focused Westward. We hope to greet you in 1920.

New Design for A.C. Motor Needed

Practically the entire industrial world was put to task some years back when the word went abroad that an alternating current motor had to be designed with two possible speed relationships to meet the conditions of the electric drive in the rapidly developing oil fields of California. It is now a matter of history that at least two of the great electrical manufacturing concerns came forward at once and set about the solution of the problem. The net result to date is that so satisfactory has proven the design of the alternating current motor in the California oil fields that this type of drive is proving far more economical than any other known system, even outdoing those sources of power directly derivable from burning the oil in its native haunts as a driving power.

Now comes upon the scene another crying need for alternating current motor design. The great agricultural centers of the West are in many instances served by hydroelectric power transmitted over long distances, consequently alternating current is alone available in many of these communities now rapidly growing into cities of no mean importance.

Fresno, California, is a striking instance of this and there is a growing demand for electric service for elevators in that city. The construction of several ten-story buildings is being contemplated. Why should not a satisfactory alternating current motor be designed to meet such pressing needs as this? If such alternating current apparatus can be made flexible so as to give the desired results a large investment in direct current lines and apparatus can be eliminated.

New Advances in Physical Units

Since the days of Faraday and Maxwell much misunderstanding and considerable confusion have arisen over the necessity of the adoption of two separate and distinct systems of measurement—the electrostatic and the electromagnetic. With the next issue of the Journal of Electricity a magnificent series of discussions is initiated by Dr. A. C. Crehore, long known to students of electrical engineering as one of the authors of Bedell and Crehore's book on Alternating Currents. This new series will point the way to a common standard of measurement for electrostatic as well as electromagnetic measurement in addition to treating of a number of other subjects of intense interest connected with theories involved in the constitution of matter.

This series of easily understocd discussions has been prepared by Dr. Crehore for the Journal of Electricity to fill a demand that seems certain to be created by the publication of Dr. Crehore's recent book entitled "A New Theory of the Atom." According to Dr. Crehore's statement in his preface to this series of articles, when the effects of the new expressions for Rydberg's constant and Planck's constant, connecting them in various ways with the electrical charge and the mass of nucleus of the hydrogen atom, are looked upon with the proper perspective, the appropriateness of the title of this series of articles, "The New Physics," which begins in the columns of the Journal of Electricity Nov. 15, 1919, is more and more manifest. The reduction of the two systems of units alone, the electrostatic system and the electromagnetic system, to one common system in terms of length and time, introduces us to a new era in physics. It is difficult to dismiss the thought that we are one step nearer to a satisfactory understanding of the nature of electricity and its intimate connection with the ether of space.

IN THE NEXT ISSUE: The Washing Machine Campaign and Plans for an All Electrical Christmas

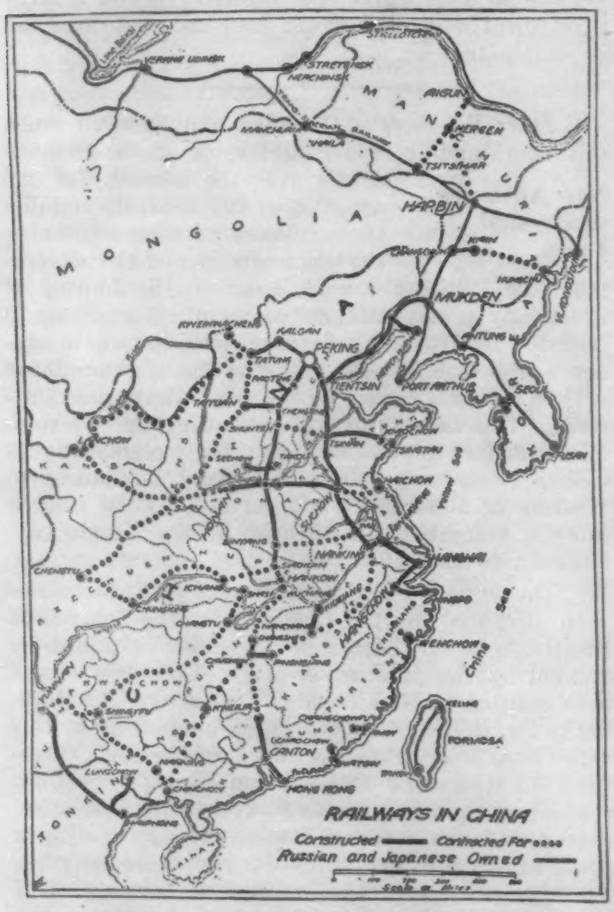
Marking and Packing Shipments for Export

BY J. C. HARRAMAN

(The satisfactory service and consequent good-will which are so essential a part of successful foreign trade are very largely dependent upon the careful packing and marking of shipments. The troubles attendant upon careless packing, and the requirements of adequate service in this respect are here described by the traffic manager of the San Francisco & San Jose Transportation Company.—The Editor.)

The proper preparation of American merchandise for shipment to foreign countries is at present a subject of great interest to all of us.

Adequate and satisfactory packing for export is a most important factor in our foreign trade, and one which no doubt is already well known to the majority of those who have been long in the business. There will, however, always be newcomers in



Vast areas in many parts of the world have but meagre railroad service, and the fact that they depend upon wagons, mules and so forth for transportation should always be taken into account by exporters in packing for shipment.

the field, and especially are these numerous just at this time—and to these newcomers the recorded experiences of the old timers will be of value, and the faults and mistakes called to our attention by consuls and commercial agents in foreign countries, which are matters of record with the Bureau of Manufacture of the Department of Commerce, are especially interesting and instructive.

Special criticism has been directed toward the packing of cotton, flour, cotton seed products, furniture and machinery.

Generally speaking, all containers enclosing shipments for export should be sufficiently substantial to withstand damage from ordinary handling in transit, and ordinary handling in transit of shipments for export differs according to their destination and the methods of transportation required. Many shipments, we will say, originate in the Middle West and move by rail to the coast, thence by steamer from which many times the cargo is lightered onto a barge, thence after reaching the land in this manner, are transported on the backs of men or animals, or perhaps on litters, dead axle wagons, or perchance railroads; and all this must be taken into consideration in packing—and the more kinds of transportation used, the greater number of transfers necessary which correspondingly affects the packing requirements. All those interested in exporting should study their maps and guides carefully and secure the information as to just what methods of transportation shipments to various destinations will undergo, and then pack their shipments accordingly.

Shipments for export are necessarily subjected to frequent and rough handling and when improperly packed will, of necessity, arrive at their destination in bad condition. The loss or damage usually falls upon the consignee or upon the shipper, as the steamship company may disclaim responsibility under the clause "not responsible for breakage," which is to be found in all bills of lading, and may also claim that the goods were not in proper shipping condition when received by them, etc.

All merchandise, therefore, intended for shipment to foreign ports should be protected by a substantial boxing and should be securely packed. At the same time the packing should be as light in weight as possible, as duty is often charged on the gross weight of the package.

Following Instructions

So much depends on the manner in which goods are packed that the shipper is never safe in ignoring the requests of the buyer, no matter how trivial they may seem. For instance, if the buyer instructs the shipper that no package should exceed a certain weight or dimensions, it is likely that the goods have to be loaded on "mule back" for shipment to the interior. Should he request that the goods be packed in tin-lined cases it probably means that the cases are liable to be exposed to torrential downpours of rain or that the humid atmosphere of the country of destination would otherwise cause deterioration.

The buyer sometimes requests that only one kind of goods be placed in each package. Should the shipper fail to observe this requirement it might result in a heavy fine by the Customs authorities, as some countries will not allow the importation of different kinds of goods in the same package.

The following statements on faulty and careless packing were prepared by an American consul of wide experience with a view of interesting the American manufacturer and exporter in this important feature of a successful export business with South America:

"It should be remembered that practically all freight for South America must be unloaded from the steamer into a launch or lighter in the open bay or roadstead, and then to the dock or pier, while the lighter is often in rough water. Thus goods are handled three or four times before they reach the Custom House from the steamer. All freight in this part of the world is handled roughly. This is to be regretted, but it is a fact that must be met if American interests are to succeed here.

"These conditions can be very largely overcome as is proven by English and other firms doing business there. They have learned that faulty and careless packing does not pay. In the first place, merchandise should be packed in medium-sized cases, say about three by two feet, where the goods are not too heavy. Where goods are packed in small boxes, as is the case with starch, catsup, malted milk, etc., the boxes should be strongly crated in packages about the size mentioned. Otherwise the small cases are put into the sling or net when being unloaded with heavier cases and are crushed, or a heavy case is allowed to fall upon them, with the same results. As a usual thing, these small wooden cases are made of half-inch boards, which are too light to be shipped without protection. Nothing short of inch stuff should be used for outside cases or crates, and this should be of tough wood. Brittle pine is almost worthless and should never be used. Then all articles contained in the case should be securely packed and fastened so that they cannot shake about in the case or rub or knock together.

"Furthermore, every case should be so firmly bound with strap iron that it would be difficult to remove a board. This is to prevent thieving, which may be practiced when boards can easily be pulled off and replaced.

"The buyer will gladly pay the additional freight charges to make sure that the goods arrive in good shape. Of course, the goods should be packed to occupy as little space as possible with safety."

Marking Packages

All goods must be distinctly marked with the port of destination, also routing. The marking of packages plays a more important part in export shipping than most American manufacturers are willing to believe. For instance, in shipping to several South American countries all the marks on the packages must be stenciled, brush marking not being allowed. Other countries require that the marks, numbers, etc., must be placed on two or more adjacent sides of the packages. Others again require the net and gross weights and kilograms on each package and a number which must correspond with the number of the package as given in the Consular documents. Failure to observe these regulations always results in fines, delays and annoyance at destination.

In connection with marking cases it is of the greatest importance that nothing but the shipping marks, such as appear on the invoice and the bill of lading, be put on the cases, otherwise the importer is liable to a fine. Frequently manufacturers use second-hand cases on which there are many old marks so that it is often difficult to make out the proper mark.

Some manufacturers have a weakness for stenciling or printing the contents on the sides of the cases, which they think will serve as an advertisement, whereas it serves principally as a guide to the man who is doing the pilfering and enables him to select the cases containing goods which he can most readily dispose of. This has been proved over and over again from the fact that certain manufacturers who do this "advertising" on their cases are more often robbed than others who have plain cases.

Protection of Valuables

Jewelry, revolvers, watches, silverware, etc., should always be packed in tin-lined cases, iron-strapped and sealed, whether this is required by the steamship company or not, and the value should always be stated on the bills of lading and receipts. The steamship companies usually issue a "special permit" for this class of goods, requiring delivery immediately prior to the sailing day. Goods of this character should never be shipped on a "Parcel Receipt" as the responsibility of the steamship company for loss, etc., is less on a shipment by Parcel Receipt than if covered by a regular bill of lading.

A steamship company or other carrier has a right to limit its liability for the loss of a package to a specific amount, unless the value of the package is declared at the time of shipment and freight prepaid according to value.

For the protection of goods both in transhipment sheds, on board steamers, and at the landing jetties, it is important that all cases, no matter what the contents are, should be strapped and sealed. This operation may take a little time and cost a small amount of money, but by doing so the shipper will find that he will have no claim for shortage and the buyer will receive what he has paid for, while otherwise he may find his cases containing half the goods he ordered and half rubbish, which the man who has stolen his goods has supplied in their place. The shipper can always protect himself by stamping on his shipping receipt and invoice "Cases strapped and sealed; see that the seal is unbroken before taking delivery; no allowance made for pilferage." If this system is followed, time, money and trouble will be reduced to a minimum.

In conclusion let me leave these thoughts of export packing and marking requirements with you:

(1) Consideration of climatic conditions.
(2) Consideration of customs charges as related to package.
(3) Methods of transportation involved en route to destination.
(4) Substantial boxing and crating to meet requirements, including strapping and sealing.
(5) Clear and distinct marking.

Water Power in Siberia

BY V. V. TCHIKOFF

(The turmoil which has swayed Russia for the past few years has detracted attention from the peaceful possibilities of her rich territory. With more settled conditions the need will arise for rapid development, and the following survey shows the extensive water power resources which are available for this development. The author is a consulting engineer in reclamation and water power and was formerly consulting engineer for the International Bank in Petrograd. He is at present organizer and publisher of the United States Industrial Encyclopedia.—The Editor.)

Siberia, almost twice as big as the United States, is a country of rather rare rich natural resources, in the development of which the water power will play an important role.

Unfortunately, no special investigations concerning water power in Siberia have been made, and we have in our hands only occasional data. However, on the basis of a study of the elevation and climate, one can sufficiently define those regions where water power is concentrated.

Topography and Climate

The River Enissey divides Siberia into two parts: the level eastern part and the mountainous western part. The level character of eastern Siberia is well illustrated by the course of the River Ob, which near Barnaul, 1300 miles from its mouth, is only 250 feet above the level of the ocean. In the south, the Siberian plains become the Kirghiz Steppes and are separated from China by the Great Altai Mountains. Western Siberia consists of a level plateau crossed by several chains of mountains.

In the north, Siberia is open to the influence of the Arctic Ocean and therefore the climate is relatively colder as one travels from north to south and from east to west—from the Ural Mountains to the Pacific Ocean. The greatest humidity in Siberia, principally in its eastern part, is in summer. Upon examining a hydrometrical map of Siberia we can easily locate two centers with a maximum of humidity of 800-000 mm. These centers are Altay and the Marifime province.

Rivers of Siberia

The Ob, one of the greatest rivers of the world, has its source among the Altai Mountains. Many of its tributaries, for instance, the Kadun, Bia, Argut and others, have numerous waterfalls and rapids. The immense Enissey has a series of rapids and its tributary, the Angara (which flows from Lake Baikal) has ten rapids of considerable size, which alone would give hundreds of thousands of horsepower. The third large Siberian river, the Lena, and its tributaries, has a great number of falls and rapids. A great many rivers, ten of which would be considered principal ones by Europe, on account of their size, flow into the Arctic Ocean, many of them with numerous falls.

Industrial Development

It is clear that millions of horsepower of water power are to be found in this immense Siberian territory. However, we can speak only of the utilization of a part of this energy, as the severe climate and desert-like character of the northern and northwestern parts of Siberia offer no possibility, at least at this time, of commercial undertakings. Better conditions are to be found in the basins of Amur and the Baikal region, and there is no doubt of the possibility and profitableness in the very near future of the utilization of water power in the region of Altay,, where there are concentrated quantities of water power, real mineral riches, and forests.

Furthermore, the southwestern part of Siberia is the most cultivated and the most densely populated; and here will be the location of industry in which water power can play a predominant part.

The nearest problem of great importance will be the development of the Siberian pulp and paper industries. Not only Siberia, but the whole of Russia as well, will be interested in this, as a great percentage of the paper for Russia's consumption was produced in Finland. In the production of paper and pulp, water power usually plays an exclusive part; in Canada, for example, 15.3% of the hydroelectric establishments are connected with this branch of industry.

The use of water power will considerably facilitate the standardizing of cement development for which Siberia is so greatly in demand.

Production of Metals

The production of cyanamid — of ammonia nitrate—without doubt will be one of the most desirable innovations in the Siberian gold industry, greatly helping in the increase of gold production, which is a well-known source of Siberian riches.

Passing over a great number of other products of electro-chemical industries, it is important to note the role of water power in the future electro-metallurgic industries of Siberia. Coal of different qualities is scattered over Siberia, but as far as I know, coal for coke of good quality is found only in the Kuznetsk Basin. Therefore, in the pig iron production in Siberia it would be necessary to economize in the use of coke or charcoal; and in this case the substitution of "white coals" for two-thirds of the computable coke would appear to be an indispensable condition for the iron industry.

The possibility of using water power in melting copper, zinc and other ores, in the production of different ferro-alloys and a high quality of steel, opens new perspectives for the utilization of the energy of rapids and falls.

Finally, hydroelectric stations can be used as central stations, distributing light and power to the cities and industries.

Generally speaking, Siberia represents an immense market, capable of requiring in future years hundreds of thousands of horsepower in water power.

A high speed electric railway from Tokyo to Osaka is one of the progressive plans now under way in Japan, and is significant of the development of the electrical industry in that country

The Electrical Industry in Japan

(The growth of the electrical industry in Japan has been little short of phenomenal during recent years. The following interesting data concerning the various lines of development is extracted from an article by Utaro Noda, Minister of Communications of Japan, in a recent issue of "The Trans-Pacific" magazine.—The Editor.)

In the ten years between 1907 and 1917 the number of electric enterprises in Japan has increased by 347 per cent, while the increase in generating capacity is no less than 661 per cent.

Today, out of about 10,000 cities, towns and villages in Japan, some 70 per cent are supplied with electricity. The per capita consumption of electricity is estimated at 47 kilowatts a year. The capital invested in the electrical industry is about three times as much as is invested in mining, which has the oldest history of any of Japan's enterprises.

This development of the electrical industry of Japan has been due chiefly to the opening up of great water-power resources. This has meant reduction in the cost of electrical production and the use of electricity as the motive power for manufacturing purposes. Various important manufacturing undertakings now use electric power entirely. Impetus has also been given to such enterprises as the electrochemical industry, which is possible only where electricity is cheap.

At the same time the electrical industry has come into close relation with the life of the whole people. It is characteristic of electricity that it increases the industrial efficiency of the people; it increases the revenue of the employes and manufacturers alike by enabling firms of small capital to employ machinery. There are also examples without number of household work being greatly facilitated by the use of electricity.

Hydroelectric Development

The first hydroelectric enterprise in Japan was begun in May, 1891, when the water of the drainage system from Lake Biwa to Kyoto was utilized in a municipal project.

Special attention is due to the hydroelectric industry. In regard to generating capacity, steam-power electricity has increased by 377 per cent during the last ten years, and water-power electricity by as much as 1,223 per cent. Ten years ago water-power electricity was not more than half as great as steam-power electricity, but the relative position has since been reversed, hydro-electricity production being about 50 per cent greater than that of electricity generated by steam-power.

The following tables will indicate the growth which has taken place:

NUMBER OF ENTERPRISES

	1907	1917	% Increase
Light and Power Supply and Tramway	177	668	277
Enterprises for Private Purposes	517	2,435	370
Total	694	3,103	347

GENERATING CAPACITY IN KILOWATTS

	Completed		Uncompleted		Total		% Incr., Completed
	1907	1917	1907	1917	1907	1917	
Water-power	38,622	511,090	142,264	456,972	180,886	968,962	1,223
Steam-power	76,288	364,473	39,862	229,953	116,150	594,426	377
Total,	114,910	875,563	182,126	686,925	297,036	1,563,388	661

In view of this development of the hydroelectric industry, the government is aware of the great necessity of making special investigations regarding water-power available for industrial purposes, and it has already started investigations throughout the country with regard to horizontal water-power which can be used for over 185 days in a year during the five years from 1918. From results so far obtained, it is estimated that the power available in the future will amount to 5,200,000 horsepower (theoretical power, as will also be the case in other references hereunder). Taking into account the power which is already being used or for the use of which permission has already been given, amounting to about 3,300,000 horsepower, it is estimated that the total water-power in this country will reach over 8,500,000 horsepower.

Increase in Electric Lighting

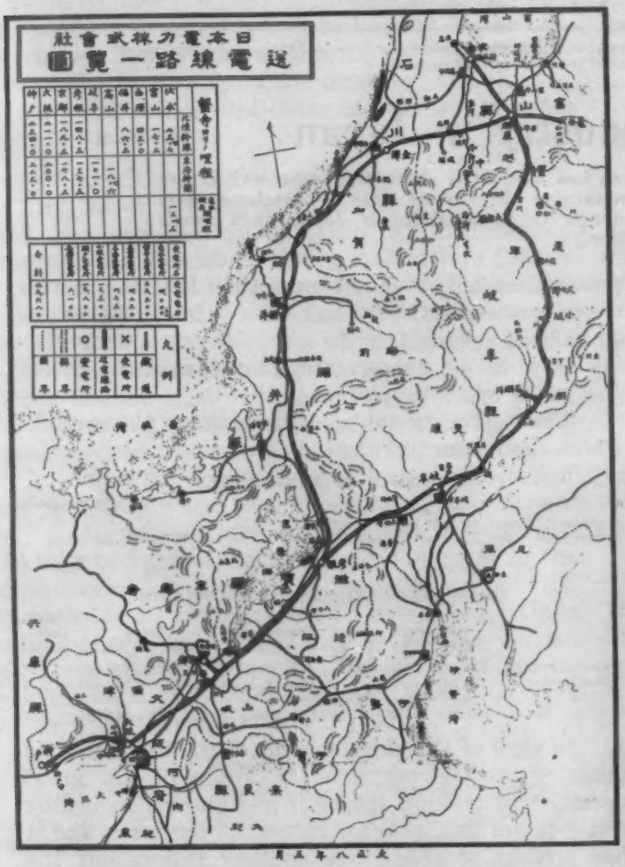
Great development and expansion have been witnessed in regard to electric lighting. As compared with ten years ago the increase is 1,000 per cent, while the increase over five years ago is over 200 per cent. At the end of 1917 the total number of

electric lamps in the country was 10,320,000 of 123,000,000 total candle-power. These figures give 99 lamps per 100 houses, and 18.4 lamps with 218 candle-power per 100 of the whole population.

Of the 10,320,000 lamps, 3,380,000 or 38 per cent were distributed among the following six largest cities:

Tokyo	1,631,212
Osaka	763,552
Kyoto	303,019
Kobe	277,571
Yokohama	223,591
Nagoya	182,781

The number of electric lamps in use in towns and cities, excepting country districts, was 56.6 per 100 of the population, the candle-power being 738.



The interconnection of a great number of small hydroelectric power plants operating north of Osaka, the industrial center of Japan, brings a large number of small communities into closer touch industrially and at the same time ensures continuity of power service. The increase in industrial demand for electricity in Japan has been very great of recent years.

Industrial Demand

As already mentioned, the increase in the demand for electricity for industrial purposes has been greater than that for lighting. At the end of 1917 the number of dynamos supplied by electric companies was 67,000 with 314,000 horsepower. These figures, compared with ten years ago, show an increase of 1,600 per cent in number and of 1,700 per cent in horsepower. In addition, 19,000 dynamos with 480,000 horsepower were installed at government works and factories for their own use, bringing the total of dynamos up to 86,000, with 794,000 horsepower.

The uses of electric power, as in 1917, may be roughly classified as follows:

Enterprises	No. of Dynamos	Hp.	Increase in Hp. compared with end of 1914
Dyeing	14,025	119,036	58,779
Machinery making	18,098	210,485	116,880
Chemical industry	7,424	134,957	73,554
Food and beverages	29,202	69,635	32,072
Mining and refining	4,870	184,041	83,615
Others	12,381	76,369	37,644
Total	86,000	794,523	402,564

Tramway Service

With the development of means of communication the electric tramway service has been greatly extended of late. When compared with ten years ago, the mileage of tramways shows an increase of 390 per cent in actual length, while the increase in the number of cars is 210 per cent, as follows:

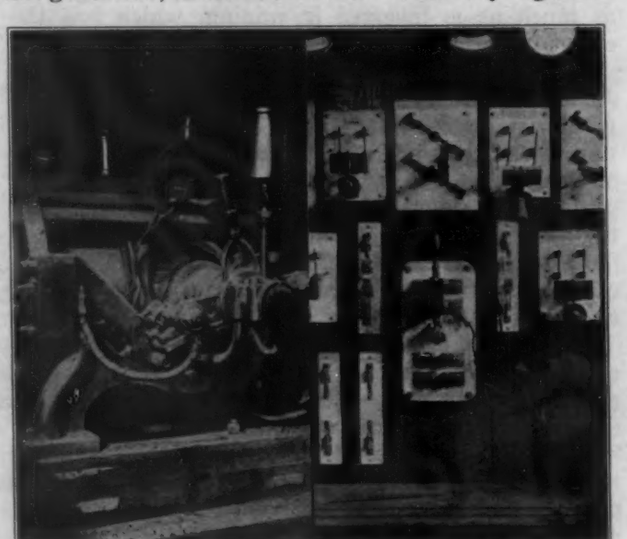
	Actual Length, Miles	Number of Cars
1907	292	1,456
1917	1,422	4,539

The increasing prosperity of the electrical industry has steadily increased the amount of capital invested. At the end of 1917 the total capital in enterprises for the supply of electric light and power and in electric tramway businesses showed an increase of 230 per cent over ten years ago. This capital represented that of concerns which were in operation and also of those which had not yet started operation.

AN OLD TYPE GENERATOR

(A remarkable and interesting electrical installation recently brought to our notice is that described below. The Latin Americas early adopted the electrical method and are now an open field for modern improvements.—The Editor.)

The dynamo shown in the accompanying illustration is an old type Thompson-Houston spherical d.c. generator, made some time in the early eighties.



An old generator and switchboard installation

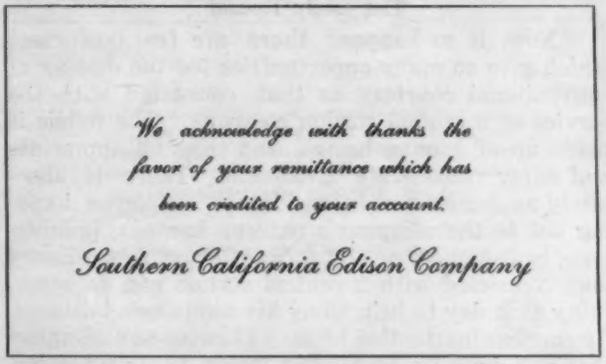
The switchboard illustrated was made up in about the same period as the generator. They were used for furnishing light in the original plant in Retalhau, Central America, about twenty or twenty-five years ago. At the time the photograph was taken the generator was, with the exception of the commutator, in excellent condition. If the commutator were turned down, it would undoubtedly answer for another twenty years. The plant has a capacity of 75-kw. and is still in operation.

The Value of Courtesy

BY S. M. KENNEDY

(Courtesy is an inexpensive investment which yields disproportionately large returns in money value as well as in daily harmony and personal satisfaction. The various types of courtesy which enter into the routine of a public utility, and their effect upon true success are here discussed by the general agent of the Southern California Edison Company in the second of a series of articles on the human element in public utility practice.—The Editor.)

Most men are of the opinion that the average Chinaman, as he is known in America, may be considered unobserving, unimpressionable and more or less of a stoic. To such men the following incident may be surprising. Not long ago, a Chinese vegetable dealer entered one of the offices of an electric company in California to pay a bill. After finishing his business, he went out to his wagon which was standing in front of the office, and filling a basket with choice fruit, brought it in and presented it to


We acknowledge with thanks the favor of your remittance which has been credited to your account.

Southern California Edison Company

An acknowledgment of receipt which goes a little beyond the mere perfunctory stamping of "Paid" on a bill is a courtesy much appreciated by the customer.

the young lady at the counter who had waited on him. The local manager, noting the incident, stepped up to the Chinaman and told him he considered that he had done a very nice thing and expressed his appreciation by personally thanking him. The Chinaman looked at the manager for a moment and then said, "She smiled and thanked me when I paid my bill." Without another word he went out of the office, climbed into his wagon, and drove away. If such a little attention is noticed by an uneducated Mongolian, it is fair to assume that the average American will appreciate any similar consideration which tends to demonstrate that his existence is recognized.

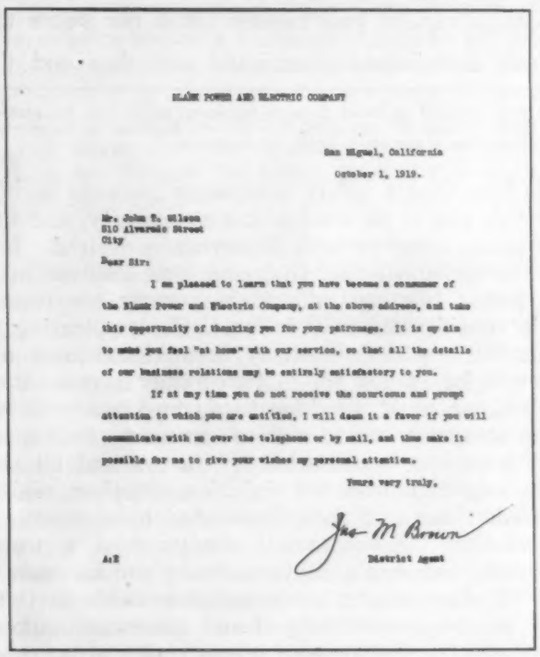
Intangible Assets

There are today approximately six thousand central station and municipal electric plants in the United States, representing a total investment of over two and one-half billion dollars. Each one of these plants possesses certain intangible assets, which now and then are inventoried for sentimental or business reasons. Among the intangible assets which it is difficult for the uninitiated to appraise is a reputation for courtesy. Yet, if a central station holds such a reputation, it necessarily possesses a valuable, though maybe an intangible asset, for, beyond peradventure, it is the best possible adjunct the central station has as a revenue producer.

The electric distributing business, as conducted by the modern central station, is a vast machine. The essence of operation in connection with the machine is good management, and good management simply means running the business with all parts in harmony. In order to obtain harmony, there must be lubrication, and as oil lubricates the engine and keeps down friction, so does courtesy in business intercourse smooth out the rough places, disarm unreasonable criticism and invite good will.

Under a Microscope

It is probable there never was a time when public utility companies were as closely scrutinized as they are today. Undoubtedly there are reasons for present conditions in this regard. In the first place, the public has gradually learned that the commodities handled by such corporations, which once were considered luxuries for the few, have now become necessities for the many. In the second place,


BLANK POWER AND ELECTRIC COMPANY

San Miguel, California

October 1, 1919.

Mr. John S. Wilson
810 Alvarado Street
City

Dear Sir:

I am pleased to learn that you have become a consumer of the Blank Power and Electric Company, at the above address, and take this opportunity of thanking you for your patronage. It is my aim to make you feel "at home" with our service, so that all the details of our business relations may be entirely satisfactory to you.

If at any time you do not receive the courteous and prompt attention to which you are entitled, I will deem it a favor if you will communicate with me over the telephone or by mail, and thus make it possible for me to give your wishes my personal attention.

Yours very truly,

Jno M Brown

AzZ District Agent

Why not let the new customer know that you are personally aware of his existence, and stand ready to serve him at all times?

through newspapers, magazines and other literature, the every day man has learned something more or less correct about the manufacture and distribution of electricity, and he considers himself qualified, as a student and a consumer, to have something to say on the subject whenever the opportunity occurs. In the third place, it must always be remembered that in the sale of an intangible commodity there is more or less mystery, and this feature is often the cause of criticism and controversy. Further, during recent years, almost every state has appointed a public utility commission, and through the commis-

sion's labors the troubles of consumers and the difficulties of the companies are alike laid bare to the public eye. No matter what may be said, truthfully or otherwise, about the methods of public utilities in the past, it may be safely asserted today that most utilities are anxious to put their houses in order, so that they may be able to withstand the closest scrutiny of friend or foe.

The Cornerstone of Success

The two greatest factors in the success of any central station business undoubtedly are courtesy and enthusiasm. These attributes must not be possessed solely by the president or manager, but must prevail throughout all departments, and in all ranks.

THANK YOU

YOU have been kind enough to favor us with your patronage to-day. We hope that you are pleased with your purchase, but if you are not, bring the goods back and we will exchange them or refund your money. It is our desire to satisfy each individual taste and with that end in

This form, printed on small bags or wrapping paper used for enclosing purchases of lamps or appliances, is a friendly reminder to the purchaser of the company's attitude towards its customers.

It is true that a utility company's business may be the only one of its kind in the community, and that the public must go to it if service be desired. It is well to remember that that condition does not make the public less critical. If consumers are treated with consideration, it is particularly pleasing to them, but if with discourtesy, it rankles through and through, because of the fact that they have no alternative, but must continue to do business with the same company. It is well to remember that many men have short memories for favors and all men have long memories for injuries, whether real or fancied. Many of those interested have reason to regret that there does not always exist a proper sympathy between a utility company and its consumers. The consumers are sometimes liable to think they are being overcharged and otherwise imposed upon, and the employes of a company are too ready to think consumers and the public "kick" too easily and too frequently. But it might be well if the employe would sometimes put himself in the customer's place, and realize that it is not an unreasonable thing for a man to ask questions and seek explanation about what he does not comprehend, particularly when he is paying out his money. No utility company can afford to be independent of the public. It is the public whom it must please, and look to for its continued existence—the same public that does not forget to remember some things which please and some things which displease. No matter how big or powerful a corporation may be, it is vulnerable—its very greatness sometimes making it a bigger and better target; and as far as independence is concerned, the man who runs a peanut stand on a push-cart, and has only a five-dollar capital invested in his business, is a thousand times more independent than the corporation with its millions. If business leaves his corner, the peanut man can push his cart along to another location, but the public utility company puts its money in the ground, and cannot take it out, no matter what conditions may arise.

It seems reasonable to study the subject of courtesy from two standpoints. The first is the kind which may well be considered between the employes of a central station and the public, and which might be termed **conventional courtesy.** The second is the kind of courtesy that reaches out, beyond the actual point of personal contact, and follows people to their homes. This, perhaps, may best be described as **aggressive courtesy.**

The Daily Round

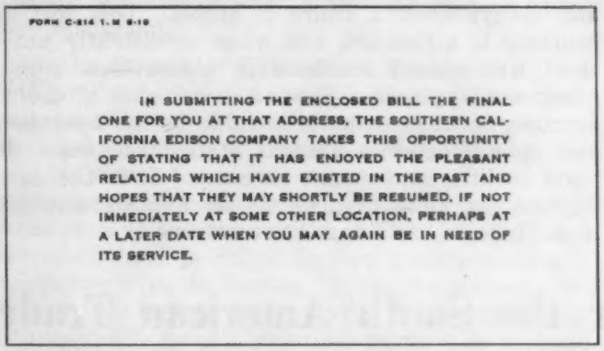
Now, it so happens there are few businesses which give so many opportunities for the display of conventional courtesy as that connected with the service of a central station company. The public is made up of human beings, and they all appreciate and enjoy considerate treatment. There is absolutely no excuse for inconsiderate employes handing out to the company's patrons hauteur, indifference, brusqueness or any form of discourtesy. Every man connected with a central station can do something each day to help along his company's business. By careless inattention he may likewise do something that will daily produce great injury to its interests. The public does not measure or judge a company by the acts of its president, officers or directors. They may be excellent men of high standing in the community, but they are usually known to only a few of the company's customers. The men who act as clerks, salesmen, collectors, meter-readers and troublemen, are the men who see the customers in

The personal 'thank-you' is at all times the best, but in default of this a sign such as is used by the Pig'n Whistle candy store in Seattle is a courteous acknowledgment which is better than none.

the office or meet them in their homes, who actually represent the company in its intercourse with the public, and it is through the words and actions of these men that the public commends or condemns their company. A central station business is not confined to any one class of people—all classes must be dealt with. It goes without saying that in the matter of treatment there should be no distinctions or discriminations between the big and the little, the high and the low, and the rich and the poor. All are equally entitled to courteous attention, and all should receive it.

Handling Complaints

The importance of the complaint department of a utility company cannot be too highly estimated. Upon the manner in which this end of the business is handled, largely depends the friendship of the company's customers, and the growth and prosperity of the company itself. The proper treatment of com-


FORM C-814 1-M 8-19

IN SUBMITTING THE ENCLOSED BILL THE FINAL ONE FOR YOU AT THAT ADDRESS, THE SOUTHERN CALIFORNIA EDISON COMPANY TAKES THIS OPPORTUNITY OF STATING THAT IT HAS ENJOYED THE PLEASANT RELATIONS WHICH HAVE EXISTED IN THE PAST AND HOPES THAT THEY MAY SHORTLY BE RESUMED, IF NOT IMMEDIATELY AT SOME OTHER LOCATION, PERHAPS AT A LATER DATE WHEN YOU MAY AGAIN BE IN NEED OF ITS SERVICE.

Courtesy which follows the customer even beyond the formal termination of business relationships will bring returns in good-will which are invaluable to the company.

plaints from existing consumers is more important than the method of managing the new business department. Satisfied consumers almost invariably become active agents for the advancement of the company's business. On the other hand, it is not difficult to estimate how much the growth of a business may be retarded by dissatisfied customers who are invariably sore through lack of proper attention and a little timely courtesy. The more people a company can persuade to think favorably of its business —the faster it will grow. As a man thinks, so he will talk, and a company with pleased consumers will have many working overtime for it, whose names do not appear on the payroll.

One of the best plans a central station manager can adopt as a means of educating employes along proper lines, is to regularly hold demonstration classes, the object being to show what should be said and done under certain conditions which may be more or less difficult to handle. Once each month would not be too often to get certain employes together. Some could represent complaining customers who come to tell their grievances, and other employes should receive the imaginary complaints and dispose of them in a proper manner.

There should be plenty of criticism and discussion and if earnestly handled, much benefit will accrue from such meetings. Employes need to be shown the importance of patience and self-control. It cannot be denied that a few customers may be utterly unreasonable, and sometimes even insulting, when making their complaints, and occasionally an employe who may be receiving a complaint will have to use restraint to keep from getting into a fighting mood. However, although a man may hold an awful tempest within himself, it won't break loose if he keeps his tongue tied down — and under circumstances of this kind, a tied tongue is safer than a loose one.

If a customer has a complaint rankling in his breast, it is well to get it out. Each complaint is an opportunity to make a new friend, and friends made this way are the sort who will gladly prove themselves friendly when the occasion offers. Little or much may be done by an employe to satisfy a complainant, but the main thing is to make him feel that his complaint was listened to with attentive consideration, that an interest was taken in his trouble, and a determination was shown to make matters right. What may have been given the complainant in the way of an allowance, or what may have been promised to improve his service conditions are only of secondary importance to the complaining consumer. It is not too much to say that a complaint may, at times, even be welcomed, because of the opportunity it gives to strengthen the list of satisfied consumers. It is not going too far to state that no adverse criticism of a company should be permitted to go unchallenged. The man who adversely criticizes should be interviewed in a courteous manner, and with a real desire to please. The critic will not be any worse for the tactful interview, and the chances are he will feel better toward the company and its business.

Aggressive Courtesy

The form of courtesy which may be termed aggressive is often evidenced along educational and publicity lines. This policy is one which points the way for consumers to remove the causes for trouble by displaying proper care in the use of their service, and frequently invites consumers to bring in their complaints, sometimes even before the consumers themselves have realized that they might have occasion to complain. Every possible means should be used to convince consumers that they are getting all they are paying for; that there is in reality no mystery about the electrical business and that electric current may be accurately measured and correctly billed. Courteous efforts along these lines help to establish confidence, and if confidence is maintained, it means more electric energy will be freely and willingly consumed. Individuals are fast learning the value of politeness. It is estimated that the people of the United States pay over eight million dollars annually to use the word "please" in their telegrams. That is—this large amount of money is paid for the word "please" when added to the stated ten words—or whatever the number may be. It is creditable to the people of America that the word "please" is so highly valued and the cost of inserting it in telegrams is paid without murmur.

Along the lines of aggressive courtesy, a Central Station company has many opportunities to impress its customers and the public with its sincere desire

to supply good service. This good service does not alone mean that an ample supply of electric energy shall always be available, but that all the niceties in the intercourse between the company and its customers will be cheerfully observed. It would be well for the Central Station manager to see that these oportunities are not overlooked. When a new customer is taken on, it is an opportunity to send a courteous letter which will surely interest and please the recipient. While giving assurances of personal interest and good service, the letter might readily point the way for the consumer to find additional uses for the commodity supplied. When the consumer sends a check in payment of his account, there is an opportunity to send a nicely worded card of appreciation with the receipt. When a consumer makes a purchase of lamps or any small appliances, the bag or paper in which the purchases are carried away might well have printed upon it a word of thanks for patronage given, and a desire expressed for its continuance. And even when a customer may be moving away and discontinuing service, there might be sent with the closing bill a card expressing the company's appreciation of past pleasant relations and a hope that they may be renewed at some future time. "Thank you" is pleasant to hear, and not objectionable when seen. If these words are stamped upon a receipted bill or stuck up in a conspicuous place over a cashier's desk, they have some value, particularly if the cashier happens to think he is too big or too busy to utter these magic words himself.

A Good Investment

To the man who is habitually courteous, there comes an inward satisfaction, which is a continuous fountain of pleasure. There is more truth than poetry in the words credited to Admiral Sir Joseph Porter, K. C. B. in the opera H. M. S. "Pinafore:"

> "For I hold upon the seas
> The expression, 'if you please'
> A particularly gentlemanly tone implants."

Be he on land or sea, the courteous man cannot fail to attract friends and disarm enemies.

Courtesy does not mean palaver, bowing and scraping—but common, ordinary every-day politeness—the kind that can give back a smile for a frown and always show a desire to please. This sort of courtesy is a fine art, and when consistently practiced, will spread sunshine in places that would otherwise be gloomy. Beyond any shadow of doubt, courtesy is of incomparable value in the operation and upbuilding of a Central Station business. It costs so little and means so much. It is the easy way to get along, represents no expenditure, yet never fails to yield handsome returns.

Sending Motion Pictures After the South American Trade

BY HARRY LEVEY

(The important part which familiarity and a degree of personal association play in the trade activities of South America give moving pictures a particular value as an advertising medium in that country. The possibilities along this line and the methods now being used by the United States and other countries are here set forth by the manager of the Industrial Department of the Universal Film Manufacturing Company.—The Editor.)

Owing to a peculiarity of the Latin temperament, the element of friendship enters into the business dealings of a South American merchant to an extent that would make a North American dealer think of the bankruptcy court. The South American, as the past has shown, will persist in buying from the man he is acquainted with. For decades the Germans were supreme in the continent below us, because they were the first to establish ties of friendship with the South Americans. It is high time the business men of America were making friends with their cousins south of the equator.

Next to doing it personally, what better way is there to get acquainted than through the medium of motion pictures?

The Film as a Letter of Introduction

A manufacturer can have motion pictures made of himself hard at work in the executive office. He can have films made of every process in his plant, from the arrival of raw material at the factory door to the final packing and addressing to "Somewhere in South America." In South America, because the Latin temperament is what it is, this personal value will be raised to the nth degree.

Let's suppose that the owner of the largest store in Rio de Janeiro has been taken by his wife to the picture show. One of the films is an American industrial picture. Perhaps it is a one-reeler restricted largely to visualizing how the American product is made. Maybe it is a five or six-reel feature with an absorbing story enacted in and about the American manufacturing plant.

Some time later, next day perhaps, a representative of this American concern calls on the Rio dealer. Why, the South American knows all about the American plant. He has been through the very place where they make the goods the salesman wants to sell. He has been in the private office of the American concern's president; he walked through the factory and saw how it all was done. He knows that thousands of other Brazilians made the trip through the same plant. His shrewd reasoning tells him that his customers are likely to buy goods bearing the trade mark they saw in the motion picture, because those customers used their eyes as he did, and saw what skill the workmen put into the products of that plant. He has this in mind when the salesman opens his order book.

What Other Countries Are Doing

Japan and England are playing their motion picture card strong in South America, and they are getting the business.

Long since the English became aroused to the power of motion picture advertising. Even during

the war, when England was exerting the last ounce of her strength against the Germans, she found time to make 1,500,000 feet of industrial film, to have ready for use when world trade opened again. During the war's darkest hour she was getting ready to defend her commercial stronghold in the "war after the war."

English merchants realize that when a possible customer starts reading a motion picture advertisement his mind is in a receptive condition. He is sitting at ease in a comfortable theatre chair. In the silence of the theatre there is nothing to distract his mind. For sixteen minutes, if it is a one-reel film, the industrial picture advertisement has the undivided attention of the audience. Screen advertising has the advantage of pictorial appeal, and it entertains while driving home the point. Language at its best only creates mental images; screen advertising is all images. In a flash of reality it will make clear to South Americans what a steamer load of literature might not.

The Bureau of Commercial Economics

The Bureau of Commercial Economics is now sending eight specially built traveling motion picture auto trucks through the length and breadth of the United States to exhibit educational films. The bureau makes no profit on its films and is supported by endowment and subscription. The United States government and principal foreign governments are cooperating with the bureau. It has the largest educational films library in the world. It exhibits many pictures itself, but its principal purpose is to loan films free to schools, employers, churches, organizations, etc., just as a Carnegie Library loans books.

The bureau is now sending more than 300,000 feet of industrial film a month to South America; of this 250,000 feet is foreign film, every foot of which is aiding the merchants of Japan and England to get that South American trade. The American industrial films the bureau is accepting for South American distribution amount to only 65,000 feet a month. The score is 250,000 to 65,000 because American industries have no more films to offer—that's all they are having made.

The Film and the Salesman

Industrial motion pictures circulated haphazard over a nation, as the bureau would circulate them, would be of immeasurable value to an American business concern as a means of getting acquainted in South America, popularizing a trade mark or institutional advertising. But if the pictures were to be used as part of a selling campaign, whereby the film and the salesman would arrive in a city simultaneously, the pictures would have to be booked through the exchange of a regular picture concern.

This is being done in the United States. For example, the Universal Film Manufacturing Company's Industrial Department made a five-reel feature picture for a correspondence school. The correspondence school's advertising was incidental to the story. The most effective industrial films are those in which love, romance or adventure are so woven about the advertising that the average theatre patron, while impressed with the merits of the product exploited, enjoys, too, the real entertainment value. The correspondence school gave the Universal distributing exchanges the dates it wanted the film shown in certain towns and the theatres it preferred. The salesmen arranged their dates accordingly. The results were such that screen advertising has become a permanent part of the school's advertising program.

The Manufacturer's Opportunity

The theatres of South America are prosperous and popular, and offer a fertile field for the exploitation of American industry. Frank C. Vanderlip has said that American manufacturers will win a world-wide market through the medium of film advertising—when they all get together and make a comprehensive start. President Wilson alluded to the motion picture as the "universal language," understood in all lands, by illiterate and educated alike. When are American business men generally going to begin speaking in this universal tongue to tell their story to South America?

THE DAIRY INDUSTRY IN SIBERIA

The dairy industry of Siberia is of such a progressive type as to present a possible market for electrical dairy devices. According to recent information from the San Francisco Chamber of Commerce, the Union of Siberian Creamery Associations is one of the largest, if not the largest of the cooperative groups. It buys and sells dairy products and equipment for more than 3,000,000 people. In the year 1917, after three years of war, the Union had a net earning of 1,500,000 roubles.

The movement has grown steadily since 1908, when the first step was taken to organize carefully. At that time 12 creameries and one distributing station were owned by the Union. Today there are more than 4,000 associations and 500,000 members. District offices are maintained in 33 central places in the dairy producing part of Russia and Siberia.

In considering the net profit to the Union, for a year, it must be remembered that the real benefit to the member is not in the money that is turned over to him in cash, but the low price at which he is able to buy machinery and other materials needed to improve his producing unit. The net profit referred to is but a sinking fund, set aside to insure other operations and guard against possible loss in the future. Among the various materials handled by the Union are cheese, butter and other dairy products. The Union maintains repair shops for the reconstruction of the various dairy and agricultural equipment owned by its members.

During 1918, 60 per cent of the total butter production of Siberia was handled by the Union, and in 1916, while Russia was actively in the World War, 98 per cent of the dairy products sold to the government were sold by the Union. In addition to the work of buying equipment and selling the product, the Union maintains a staff of expert instructors in the most up-to-date methods of dairy work, publishes two magazines and several newspapers. As a result of this educational work, the Siberian dairyman is rapidly becoming a big factor in the world's dairy product.

Future Trade Relations in the Pan-Pacific

BY JOS. McELROY, 3rd

(The growth of international trade is not a one-sided affair engineered by the seller in search of foreign markets, but a mutual benefit dependent on mutual activity. This article, urging the "foreign market" itself to make a point of getting in touch with the best source of supply as a matter of self-interest, is written by the export sales manager of Pass & Seymour, Inc., New York.—The Editor.)

In many of the countries bordering on the Pacific Ocean the use of electricity is in its infancy and will probably increase tremendously during the next twenty years. Unlike other lines of foreign trade, such as hardware, the sale of electrical articles of all kinds should constantly increase in volume on account of the increased use of electrical current.

Standard Goods

In most countries which are just introducing electricity it is very desirable that they start properly by introducing American standards, and thus put themselves in a position to secure constantly new supplies of all the different articles without delay. Furthermore, the American standard of electrical devices is of the highest type and finish, and practically all the articles formerly made in Europe, principally in Germany, can now be obtained from the different manufacturers in the United States. In many instances slight improvements in the interior mechanism have improved the foreign type of article which is manufactured by the American manufacturer.

There exists in this country at the present time a greater desire for foreign business than has ever existed here before. Nearly all firms of importance are giving the subject consideration, with the result that any foreign merchant purchasing electrical articles from a United States manufacturer of good standing, can be assured of receiving his goods properly packed according to his market conditions or in accordance with his instructions. He will usually find also that the American manufacturer will grant him the credit terms to which he has been accustomed.

Unwise Delays —

There has been a tendency on the part of many foreign buyers to delay in the purchase of their requirements in the belief that prices would decline upon the termination of the world war. This is a mistake. There is no prospect of a general reduction in the price of electrical articles because the price of raw material has not declined to any large extent, while the cost of labor continues very high and in some instances is actually increasing. In addition to this is the fact that during the last four years building all over the United States was suspended, with the result that there exists at present a great shortage of dwelling houses of all kinds, as well as office buildings. Building is now being resumed in all the principal cities with a consequent demand for an enormous quantity of material. Very few factories have been able to accumulate any stock, and now that the demand from the domestic market is beginning to set in, due to the increased building, it is predicted that before the end of the year 1919 there will exist an acute shortage of many electrical articles. In view of this condition, therefore, it is the part of wisdom for the foreign buyer to place his order for his current requirements as promptly as possible in order that the American manufacturer may give him service and prompt delivery.

Transportation Service —

The fact that the United States government plans to maintain a large mercantile marine in the future will give foreign purchasers a frequent and regular steamship service at a reasonable freight rate, and as the United States is a large purchaser of the products of countries bordering the Pacific there should be no difficulty in obtaining a full return cargo for these steamers. There is no country today in a position to supply electrical articles of all types to the foreign buyer excepting the United States, and this condition will probably exist for several years.

Developing Trade Relations —

One result of the great world war has been that the people of various countries have been drawn closer together and have become better acquainted. We have a very friendly feeling toward our fellow Americans living in South America, and it is our endeavor to assist the Chinese as much as we can in the development of their huge country. It is naturally to be expected that the Hawaiian Islands and the Philippine Islands would be customers of the United States inasmuch as they are United States territory. It would pay the plantation owners in these territories to examine the catalogs of the American manufacturers; they will be surprised at the many articles that are made which will aid them in their daily business and also be indirectly a source of profit to them. One item in this connection is well worthy of mention, and that is the farm lighting outfit which is now manufactured by a number of different firms. This has proved a great comfort and benefit to many isolated farms and plantations in different sections of the world, and the sale of these outfits is increasing very rapidly. The plantation and farm owner cannot only light his house and grounds but can also put the machine to other uses, such as churning, sawing wood, etc.

It is a matter of common knowledge that Japan has entered into the manufacture of electrical articles very largely during the last ten years, but in spite of this fact she finds it convenient to purchase large quantities of electrical articles from the United States, as the statistics show: for instance, during the month of March there was exported from the United States to Japan $3,972 worth of electric batteries, $174,369 of dynamos or generators, $2,813 of electric fans, $3,079 of heating and cooking appara-

tus, $3,151 of insulated wire and $29,679 of incandescent metal filament lamps, $40,406 of magnetos and spark plugs, $50,493 of meters and measuring instruments, $145,512 of motors, $30,321 of switches and accessories, $21,805 of telegraph apparatus, including wireless, and $103,271 of transformers. This is only a partial list of the electrical apparatus imported into Japan during this one month.

For many years Australia, New Zealand and Tasmania have been steady and consistent buyers of American made articles, and it is to be expected that the trade between these two countries will continue to increase in the future. A commissioner from the Dutch East Indies has pointed out that while the statistics show a large increase of trade and many millions of articles purchased by his people from the United States during the past year, this trade can still further be increased owing to the needs of his country.

The prospective purchaser of electrical material residing in countries bordering on the Pacific Ocean should make a point of getting in touch with reputable manufacturers of these articles in the United States from whom he will secure fair treatment, credit terms to suit his convenience, and goods well packed and of a superior quality.

Trade Opportunities in Latin America

BY GEO. W. FISHBACK

(Latin America offers to the United States one of the most fertile of all fields for foreign trade expansion. The present trade conditions existing between the two countries, the need for increased activity, and the channels of approach are dealt with in the following article. The author, who is now in charge of courses in foreign trade being given at the College of Overseas Commerce, has had extended experience in the diplomatic service in South America.—The Editor.)

Opportunity for trade in Latin American markets is knocking insistently at the doors of our manufacturers, and incidentally at those of every young man and woman who will qualify now to work out as fine a career as was ever offered to any generation.

That career may be in commercial, scientific or professional fields, or it may be in the diplomatic and consular service. To qualify for activities in any one of them means becoming familiar with those markets; with the people in them; with their languages; with their customs, and with their methods of daily intercourse, in the drawing room as well as the counting room. To establish an entente cordiale with the people you are going to deal with is the first prerequisite in the South American atmosphere, and in order to do that you must consider their viewpoints, as well as your own, and observe throughout the association the amenities of a friendly and cordial intercourse.

CALLE FLORIDA, BUENOS AIRES

This street is the main artery of the city of Buenos Aires, and the center of business activities. The rapid development in some of these South American cities offers a splendid field for United States enterprise if effort is expended in the right direction.

The commercial situation in which we find ourselves today is as follows:

Our total exports for the fiscal year ending June 30 of last year amounted in round figures to six billions of dollars, and our imports for the same period were about three billions. Twenty per cent of those exports were war supplies. During that same period, our exports to Latin America were seven hundred and forty millions, and our imports were a little over one billion dollars. This shows that we supplied about 40 per cent of the imports of Latin America, as compared with 15 per cent for some years preceding the war. Latin America consists of Mexico; six republics in Central America; three in the Caribbean, and ten in South America.

The Need for Effort

Now, the above amounts are enormous, and show that a big proportion of the world's trade is today within our hands—but we must bear in mind that this trade has come to us without any great effort on our part, and largely because the demand could not be supplied elsewhere. We have not done very much to facilitate it, and the extension of cred-

AVENIDA DE MAYO, BUENOS AIRES

Note the ornamental lighting system on this fine street. In the few large centers on the west coast electrical development has reached a very advanced stage; its main use outside the cities is confined to the mines.

its to foreign buyers has been very limited—in fact, most of our exports have been paid for before shipment, or at the very latest, just after delivery. Now, it can easily be seen that this trade now existing can never be retained when European exporters are again in the field ready to deliver goods, cut prices and extend credits as they did before, unless we now thoroughly cultivate this vast field of opportunity. And the way in which to do it is to meet our customers half way; to study their needs, customs and notions; to sell to them at fair prices; to extend credits and increase good will and friendship and thus develop a structure that will be lasting, and a trade that will not easily be moved when our active competitors again get under way — and there are evidences already of renewed activity. We are going to feel the need of as large a foreign market for the output of our factories as it is possible to develop, and there never was a time in the history of the United States when a discriminating, steady foresight was more necessary than right now. In Latin America the natural resources are boundless, they are as yet comparatively untouched, the people are well disposed towards us, we have a big surplus of production, we have the ships in which to carry it, we have the banks through which to clear it, and we have at our disposal the distributing power of solid, financial importing houses in every big city south of the Rio Grande, with whom connections can be made by the mere wanting to, and the knowing how. The tools are all at our hand—it remains for us to use them with intelligence and skill.

Channels of Development

The spirit of foreign trade is abroad in the land, the movement extends from coast to coast, men and women are studying languages and countries and

THE PLAZA HOTEL, BUENOS AIRES

This hotel is one of the most famous in South America, and is significant of the spirit of progress which pervades the country and is reaching out for foreign trade. Building activities are only one phase of the rapid growth which is so closely bound up with electrical development; electric railways already in operation are phenomenally prosperous.

methods of foreign intercourse, in order to qualify for an overseas career, representing American interests, either commercial, scientific, or political.

The United States diplomatic and consular service, and the working relation between it and our foreign commerce, is a subject worthy of high consideration and study, purely as an instrument for the extension of our trade abroad. As Mr. McKinley

ARGENTINE NATIONAL CONGRESS

The diplomatic and consular service of the United States in South America is intimately connected with the trade relations of the two countries. To maintain the friendly feeling between the peoples, to study the international needs, and to promote the activity of the commerce—these afford an important opportunity which falls to United States representatives in South America.

referred to expositions as "Milestones of Progress" —so our consulates are known as the outposts of our commercial army. The relationship is most intimate, and our consular service has been since 1906, and is today, the best among those of the great powers. The question of establishing a special course of training for the service has been undertaken by the College of Overseas Commerce in San Francisco, with offices in the Flood Building.

Present Status of Trade Relations Between United States and South America

The total commerce between the United States and Latin America in the calendar year of

1915 was	$ 921,000,000
1916 was	1,261,000,000
1918 was	1,990,000,000

United States imports from Latin America were:

1916	$ 776,000,000
1918	1,250,000,000

United States exports to Latin America were:

1916	$484,000,000
1918	740,000,000

This shows the possibilities of the trade.
We exported to South America—

In 1870	17 million	— 4½%	of total
In 1900	38 "	— 2¾%	" "
In 1910	92 "	— 5½%	" "
In 1913	146 "	— 6 %	" "
In 1916	484 "	—15 %	" "
In 1918	740 "	—40 %	" "

The question now is: Are we going to hold this 40% of the total,—are we going to increase it, or are we going to allow it to fade away because of indifference and neglect of a wonderfully rich market?

Standardization With Metric Units

BY AUBREY DRURY

(Who knows but what the interruption of the great engineering feat of ancient history as recorded in the Bible—the building of the tower of Babel—was due to the confusion of tongues in matters of units employed in measurement? Not until our Allies had in a measure standardized much of engineering manufacture and design did we begin to make an imprint on the common enemy. The days of readjustment now upon us demand serious consideration of immediate adoption of metric units. Here is a timely and forceful discussion on this important subject by the Associate Editor of the Journal of Electricity who has given months of time and study to this important problem.—The Editor.)

SINCE the armistice there has been much effort at reconstruction. In practically every field of human endeavor plans are being evolved which aim to repair the ravages of War, to place humankind on a normal basis and above all to bring the world closer together. In bringing about a better understanding and greater power for co-operation among all humankind, we are learning at the beginning of what promises to be an enormous expansion of world trade a lesson which we had borne in upon us during the exacting trials of the war—the fact that one of the vital needs of the present-day world is a logical uniform standardization of weights and measures.

The Decimal System

There is only one real "system" of weights and measures now in use. It is that simple, decimal system which employs the 3 principal metric units: meter-liter-gram. This system has been adopted as the sole standard by 34 important nations and in 212 countries of the world the metric units are more used than any others. In fact, the United States of America and Britannia stand virtually alone as nations which have not recognized the infinite superiority of the metric system.

Although the first to apply positional decimal arithmetic to coinage, weights and measures was a Briton, James Watt, who offered it to the world in 1783, of all the nations the English speaking peoples alone cling to the inadequate system of yards, feet, inches, tons, pounds, ounces, quarts, pints and gills and so on without end, and the ironical side of the matter is that this clutter of illogical, irrelated, bewildering weights and measures originated in Germany.

It is a relic of the old German Hanseatic Trade League which foisted it on England, although Germany herself scrapped these antiquated standards in 1871 in the interests of national efficiency.

The Lesson of the World War

During the war we found, when we began our gigantic task of transportation, equipment and supply, that in the essential matter of weights and measures we were not at one with our allies. We found that 30 nations fighting Germany were all using the metric units of weights and measures, and were thus capable of complete coordination and united action. But the United States and Britannia discovered they were using an antiquated jumble of weights and measures which had been scrapped by all other enlightened people more than a generation before. And although the so-called "English" system of weights and measures was supposed to be standardized, we found a confusing difference between the measures of the United States and those of Britannia.

America and Britannia had ample cause to regret, during the war, that they had not heeded James Watt in 1783, and Thomas Jefferson in 1786. Read in the report "America's Munitions" by Benedict Crowell, Assistant Secretary of War and Director of Munitions, just issued by the United States Government printing press, how America was hampered and delayed by the necessity of translating specifications into metric measurements. He speaks of the loss of weeks and "even months of time" on the part of whole staffs of experts working at high tension.

Need for Standardized Munitions

He tells of the redesigning of American and British guns to conform to the measurements of the famous 75 millimeter pieces of the French, and in order to utilize French, Italian and other allied ammunition. These examples are typical of the wastage, the delay, the confusion caused by our adherence to antiquated standards of weight and measurement, while the rest of the world had progressed to scientific uniform standardization.

The war was full of lessons in this regard. Two million Americans in France had actual experience with the metric weights and measures and found them easy to understand and simple to use. Both American and British armies found that it was absolutely necessary to become standardized with all allies, and both governments with the object of obtaining the utmost efficiency in warfare, ordered the adoption for military purposes of metric units, the British in 1914, and the American War Department through General Order No. 1, in January, 1918.

How much better off we should have been if instead of waiting for General Order No. 1 we had adopted metric standards exclusively when Benjamin Franklin and Thomas Jefferson urged the United States to do so in 1786, or even if we had taken them up when Germany did, in 1871.

Long Under Consideration

It is a fact that ever since the time of Thomas Jefferson and Benjamin Franklin this question of reducing our weights and measures to a rational standard, interchangeable with the standard used by the majority of civilized nations, has been more or less energetically discussed by the public and dallied with by Congress. Fortunately, at the instance of Thomas Jefferson, we adopted in the United States of America decimal money and thus we are at least one step ahead of the British Isles, which still cling to the

bewildering pounds, shillings, pence and farthings of an antique German coinage.

Yet America is in the main like Britannia. Both are in this case victims of inertia and slavery to blind tradition.

Now interest is aroused in meter-liter-gram, however, not alone because of the greater simplicity of the metric system and its superiority as a working tool, but more because of the fact that post-war traditions have laid new emphasis upon world-trade and opened new prospects of the part that the United States is to play in the commerce of the world.

Best for World Trade

Far-sighted men who have studied international trade conditions and who have the commercial interests of the United States at heart have come to the unqualified conclusion that we are attempting to enter upon world trade equipped with the wrong tools. Vast markets for American goods are seen in South America and the Orient, and only of late have merchants come to the disconcerting realization that as far as the language of quantity goes—and that is the all-important part of language in world trade—we do not speak in the same terms as the people of South America or the Orient. We find that while we insist upon dealing in our difficult and cumbersome weights and measures, the peoples of South America have for generations used exclusively the system of metric measurements and are disinclined to understand any other.

We find, too, that in the Orient, particularly in China, it has been decided that metric measurement shall ultimately be adopted exclusively. China is now in the process of turning her 426 million population over to the use of metric weights and measures. Japan, too, has a commission studying the subject; and the last Trans-Pacific Magazine predicts a decision for exclusive use of metric standards, already extensively employed in Japan.

Word from Eminent Authority

On November 10, 1918, the International High Commission of which W. G. McAdoo, then Secretary of the Treasury, was Chairman, announced that this subject was deemed of particular importance to the United States and that in the opinion of the United States Section of the Commission, "adoption of the metric system would be of great advantage to the commercial relations of the United States with the other American Republics."

This attitude is identical with that assumed by Secretary of Commerce William C. Redfield, who has advocated unqualifiedly the adoption of metric units by the United States in the interests of world commerce. He says:

> "I have heard men say that America can sell and is selling quantities of goods abroad without the use of the metric system. Certainly that is true. She can do that to a certain extent, but compared to what America could do if she would adapt herself to the needs of the people abroad, it is like selling remnants.
>
> "The day when any nation engaged in industrial production could impose its ideas and views on any other nation to which it desired to sell goods has gone by, if it ever existed, and the only way you can sell goods in these days is to sell to people exactly what they want. A company must sell its mechanical goods of all kinds in the markets of the world, made in the way the people want them, and no amount of explanation on the part of the salesman will make the U. S. standard wrench go on a hardened nut finished on the metric system, and it is nonsense for anyone to suggest anything to the contrary. It won't fit, and you can not sell any more goods of that kind.
>
> "For men to go to a French factory and attempt to sell for use in that factory an engine constructed on the feet and inches basis, would be so hopelessly ridiculous that only a man entirely lacking in judgment would ever do it."

Meter-Liter-Gram in Export Trade

Again Redfield declares:

> "From a practical standpoint, now that Germany is out of the export field for a considerable number of years, with the likelihood that as an economic force she may be reduced to a minor place, the nations of the world which Germany supplied with goods are looking to Great Britain and the United States for supplies. Shall they get them?
>
> "If you had been a hardware dealer in Buenos Aires or Santiago, Chile, you would have bought tools and supplies in Hamburg or some other German city. You would have gone there for your stock, and in all probability you would have been buying there for 40 years or more. Material would have been sold to you conforming to your national standards of measure in Chile or Argentina or Brazil, and now where will you get it made to your standard of measurements? In Great Britain or the United States? Not unless the American manufacturers are wise enough to do what the Germans did so successfully before.
>
> "If the Chilean merchant or the Brazilian merchant goes to the United States and seeks commodities in centimeters and millimeters, and finds them in inches and half inches, and if he comes in contact with that absurd measure called a half of a sixty-fourth, he will look to see where he can find men more flexible in mind and more intelligent in their practical applications."

The arguments applied to South America apply to the Orient and they apply to all those nations of Europe (and that means every one except Britannia) which now use metric units. As Nicholas Murray Butler, President of Columbia University, well says: "Adoption of the metric system by English-speaking peoples would advance world trade as it has already advanced science."

Organizations Favor the Advance

Commercial organizations and associations of manufacturers are now awake to these momentous facts. The American Chemical Society, with 13,000 members, has passed significant resolutions, reading: "It is unanimously voted that the American Chemical Society heartily favors the universal adoption of the metric system, so far as possible, to the exclusion of all others, and that the Committee on Foreign Chemical Trade be requested to use its influence to have the metric system adopted in America's foreign trade, in order that this country may compete in countries that have already adopted this simplest and most perfect system of weights and measures."

American Institute of Electrical Engineers voted for the adoption of meter-liter-gram for general use, by a large majority.

American National Wholesale Grocers' Association voted overwhelmingly in favor of adoption of metric units.

American National Canners' Association urges adoption of metric units. This sentiment was passed at a convention of 5,000 delegates.

Recently the Washington State Manufacturers' Association urged the adoption of the metric system by a 2 to 1 vote.

Among the many other important organizations which have been active in advocating exclusive use of meter-liter-gram are: Associated Steel Manufac-

turers of U. S. America; American Association for the Advancement of Science; American Drug Manufacturers' Association; American Institute of Chemical Engineers; American Pharmaceutical Association; American Institute of Makers of Explosives; National American Association of Retail Druggists; National American Association of Wholesale Druggists; National American Scale Men's Association. There are signed petitions to this effect now in Washington, D. C.

Support by Eminent Men

The World Trade Club of San Francisco has been conducting an aggressive campaign for the exclusive adoption of metric units, and has secured the endorsement of hundreds of eminent men throughout the world. Among the prominent individuals who support this movement for standardization are William G. McAdoo, Franklin D. Roosevelt, John Hays Hammond, Henry Ford, Luther Burbank, Thomas Edison, Hudson Maxim, Henry van Dyke, Major Fiorello La Guardia, A. E. Kennelly, David Starr Jordan, Thomas C. Mendenhall, George Frederic Kunz, James Speyer, Albert Bushnell Hart, Bliss Perry, Theo. N. Vail, Alexander Graham Bell, Otto H. Kahn, George W. Perkins, Dr. Charles H. Mayo, R. T. Crane of the Crane Co.; Samuel Gompers, John Spargo, Major-General William C. Gorgas; John H. Gerrie, editor of Pan-Pacific Magazine; Judge E. H. Gary; George Otis Smith, Director of the Geological Survey; and hosts of others.

Andrew Carnegie said to the American National Association of Manufacturers: "Our present weights and measures are unworthy of an intelligent nation of today." Dr. Charles W. Eliot, President Emeritus of Harvard University, wired the World Trade Club: "The adoption of the metric system by the United States of America would greatly reduce labor in trades because of the thorough decimal quality of the system and would facilitate the teaching of mathematics and applied sciences in schools."

One of the most eloquent appeals ever made in behalf of the metric system was that by Charles Sumner in the Senate of the United States of America, 1866. He declared:

"A system of weights and measures born of philosophy rather than chance is what we seek. To this end old systems must be abandoned. A chance system cannot be universal. Science is universal; therefore, what is produced by science may find a home everywhere."

Engineering and Industrial Standardization

BY C. A. ADAMS

(Standardization is coming to play a large part in all modern progress. Its application in engineering and industrial fields is here discussed by the chairman of the American Engineering Standards Committee, an organization recently formed to remedy the present unsatisfactory conditions. The Committee's formation, scope and procedure were described at length in the August 15th issue of the Journal of Electricity. The following material formed part of a paper presented recently before the A. I. E. E.—The Editor.)

Most of us speak of standardization in a vague sort of way, usually having in mind some particular corner of the field, but without sensing the comprehensiveness of the word or the magnitude and importance of the field covered, not realizing that the cooperation without which our modern society would be impossible, would in turn be impossible without a large measure of standardization. It might almost be said that the degree of standardization in any nation is a measure of its civilization, certainly in the material or industrial sense of the word.

Comparative chaos still reigns in most parts of the field of engineering and industrial standardization, not only in the standards themselves but underlying this in the methods of creating them.

Technical Language

One of the first needs is for the standardization of definitions of scientific and technical words, terms, phrases, abbreviations, symbols and diagrams.

Standardization of these elements of our technical language is just as fundamental to intelligent intercourse in this field as in the case of ordinary word intercourse; in fact it is more fundamental since we are here dealing mostly with accurately measurable quantities.

Some progress has been made in this field even to the extent of international standardization of terminology, but chiefly in connection with very fundamental matters, there being still in the outlying fields a very wide diversity of usage in the matter of symbols, abbreviations and diagrams, and in a lesser degree in the use of words. There are at least fourteen different organizations in this country alone, each of which has its own system of diagrammatic representation covering electrical wiring and devices. Many other similar illustrations are available of the frightful inefficiency of the present haphazard, uncoordinated work in this field.

Standards of Quantity

In the consideration of length, area, volume, mass, weight, density, pressure, heat, light, illumination, electricity, magnetism, radioactivity, physical constants and their relation to each other, the same point arises.

Some of the fundamental standards of this group are of such importance in the every-day life and trade of a nation that they are prescribed by law and each city or county has the necessary machinery for enforcing the law.

Nearly all European nations as well as the Latin-American nations have adopted the rational metric system, whereas the English speaking nations still cling to the English system with its confusion of oddly related weights and measures.

However since the electrical and magnetic units are the same the world over, since they are based

upon the metric system, and since practically all scientific work is handled by that system, a vast amount of time is wasted by the English speaking nations not only by the necessity of becoming familiar with both systems, but also in their use due to the frequent necessity of transformations from one to the other. This latter loss is particularly serious in the field of electrical engineering.

Standards of Quality and Performance

Specifications for materials together with standard methods for testing their qualities are another consideration.

Certain standards of this type are also of such importance to the welfare of society that they are prescribed by law, notably in the food field, and a bill is now before Congress for the standardization of fertilizers.

Standard specifications and tests for the materials of engineering and construction are almost wholly prepared by the American Society for Testing Materials, which society was organized solely for this purpose. In no other field is the work of standardization better organized.

In the field of operating characteristics of machines and devices, output, rating, speed, efficiency, durability, etc., as specified in terms susceptible to measurement, together with the methods of making these measurements, the most notable example of comprehensive work is to be found in the Standardization Rules of the A. I. E. E. Another is the Power Test Code of the A. S. M. E.

Standards of Practice

Among regulations or codes dealing with construction, installation and operation, based upon considerations of safety, quality, economy, convenience, etc., the oldest code in the electrical field is the National Electric Code of the N. F. P. A., first issued in 1897 and since frequently revised. This has been largely copied in the local municipal regulations of most large cities.

The National Electrical Safety Code was issued about three years ago by the Bureau of Standards after long and careful collaboration with the most interested organizations. This covers safety to life rather than fire protection.

There is now under consideration the preparation of some fifty-odd industrial safety codes. This work will probably be carried out according to the procedure prescribed by the American Engineering Standards Committee, with the appropriate organizations acting as sponsors. The Bureau of Standards will doubtless serve as sponsor for some of these codes.

Types and Designs

In the standardization of types and designs, most of the work has been done, until comparatively recently, within individual corporations as a matter of production economy. A notable example of this is the Ford automobile.

But within the past few years much has been accomplished in the automobile industry as a whole by the Society of Automobile Engineers.

This also is true in certain parts of the railway field in the standard freight and passenger cars, through the Master Car Builders' Association. The variety however is still enormous. There are at least 500 different types of locomotives, although the U. S. Railroad Administration has recently reduced the standard types of passenger locomotives to twelve.

One of the most striking examples of the possibilities in this field is the attempt only just started by one of our most progressive manufacturers of electrical machinery, to develop standard electric motor designs. Nine manufacturers are working together to this end. Consider the immense advantage to the consumer resulting from the general interchangeability of parts, and the reduction in the number of spare parts carried by a user who has motors of several of these cooperating manufacturers. Moreover the designs will contain the best features of all these makes, and there will still remain ample opportunity for competition in production cost and quality of workmanship.

Need for Standardization

An illustration from the electrical field of the need for standardization has to do with the rating of electrical machinery. In the early days there was no agreement as to what was meant, e. g., by a ten-horsepower motor. As a result fair competition was impossible. The ratings of the several manufacturers varied as much as 30 per cent and the customer was at the mercy of the persuasive talents of the salesman. It took the Standards Committee of the A. I. E. E. five years to revise its old system of rating of electrical machinery in such a way as to be rational, scientific, satisfactory to all concerned, and capable of reasonably accurate checking by commercial tests. The results of this work have proved to be of world-wide value. They have placed competition on a far more equitable and generally satisfactory basis; they have encouraged more careful and thorough designing; they have encouraged a more careful selection of size on the part of the user, and have generally resulted in better machines.

Machinery of Standardization

At present the work of standardization is carried on by numerous organizations each in its own field and with its own machinery, usually through a standards committee. But the fields overlap and the machinery differs largely in the different organizations. In many cases the committees are made up of men who do not realize that a standard must be not only rational and technically correct but also acceptable to all those interested in its production and use. The mere promulgation of a standard by any society, however powerful, does not make it a real standard.

Moreover the fields of the several organizations overlap in large degree; there is much duplication of effort and confusion of result, and many of the standards promulgated are practically useless.

Cooperation between two or more organizations has been tried, sometimes successfully, but there was no recognized machinery of cooperation, no standard procedure, and confusion still reigns. It is to meet this need that there has recently been created an American Engineering Standards Committee.

The Size of Ships and Pacific Harbors

BY C. E. GRUNSKY

(The tendency toward increasing the size of ships is one of the factors which limit commerce to the two or three principal ports of the world. The suggestion here made that ships be kept within a limit of size which will enable them to make use of the normal harbor is a matter of great importance to Pacific trade. The author, who is a prominent consulting engineer of San Francisco, was a member of the first Panama Canal Commission upon which devolved the necessity of determining the width of the canal — another factor affecting the size of ships suited for Pacific trade.—The Editor.)

The question of dimensions to be given to maritime canals is understood to relate specifically to the minimum dimensions of the canals and to the dimensions of the large sea-going vessels. The inter-relation of the size of the largest sea-going vessels and of the required dimensions of the canals is recognized in the question.

If it be admitted that the dimensions of the sea-going vessels are to be determined solely by the needs of trade and commerce, by economy of operation, and by the demands of passengers for speed, comfort, and luxuries, without regard to harbor facilities and without regard to the possible usefulness of the vessels to their governments in case of war, then it becomes comparatively easy to predict future growth.

But, and perhaps fortunately, there are other considerations to be taken into account, notably the general usefulness of large vessels, which, according to their size and particularly their draught, may be materially restricted by the dimensions of maritime canals and the depth of the approaches to the principal harbors of the world. The ever increasing size of vessels has compelled the enlargement from time to time of maritime canals and harbor approaches. Among these are such instances as the improved Weser, where the present requirements were not foreseen when the improvements were planned by Franzius in 1879 to 1881; the Kaiser Wilhelm Canal, built in 1887 to 1895 and later enlarged at a great cost; the Suez Canal which has been made wider and deeper and now has sufficient depth for vessels with 28 feet (8.53 meters) draught.

If the deepening of the harbors and of harbor approaches is continued without restriction the size of the largest ocean liners will, under otherwise permanent conditions, continue to increase.

Without any restrictions upon the size of vessels, they will be built constantly larger as demanded by economy of operation and by the needs of commerce, and only those ports can hope to be favored with the visits of the largest vessels which find it worth while to afford suitable harbor facilities.

The growth of vessels, therefore, exerts a strong influence upon the concentration of the export and import business at certain points, such as New York harbor where nature has made possible the construction of the facilities demanded by the ship owner who wants to operate the largest boats that can with safety and without delay be taken into and out of the best harbors on the two sides of the Atlantic.

It follows from this that it is to the interest of the port which is less favored by natural conditions that some artificial limit be set to the size of the ocean carriers, particularly in the matter of draught, in order that harbor improvements may be planned with reasonable certainty that they will be adequate.

There should be an international agreement entered into that some depth of water at low tide is the standard to which the important harbors of the world should be improved and there should be no government aid in the form of subsidy or otherwise to vessels whose dimensions are such as to make the entrance into a harbor of standard depth impossible.

It would be unwise, for example, for the United States to construct or to encourage by subvention or otherwise the construction of vessels too large to pass through the locks of the Panama Canal.

By the construction of the Panama Canal, a stupendous undertaking, the United States has practically set an upper limit for the dimensions of vessels whose construction can be encouraged by the government. The canal and the lock system on the canal have cost too much to be readily modified. For the time being the usable lock length on this canal of 1,000 feet, the breadth of 110 feet and the depth of 41.5 feet on the sills of the lock gates, equal to 40 feet in salt water or to 12.2 meters, has fixed the maximum dimensions both of war vessels and other vessels that are likely to be constructed by the United States or by American owners under government aid.

But if standard maximum dimensions for the largest desirable sea-going vessels be thus set by the United States, or by an international agreement participated in by the important maritime nations, this will not set a limit to the further improvement of shipping. There is room for improvement even when the limit of size has been reached. The internal combustion engine for example is full of promise and may be of material aid in increasing cargo capacity. The gain in cargo capacity resulting in the use of internal combustion engines would, moreover, be of particular value because it is obtained without an increase in displacement. So, too, in the matter of speed there need be no limit set, unless for subsidized vessels it be a lower limit. If the reduction of weight of machinery and of fuel in the motor boat compared with the steam boat even approaches some of the expert estimates, there should be ample opportunity for securing high speed without being compelled to give the vessels abnormal dimensions.

The following conclusions appear to be justified:

I. It is desirable that a limit be set to the draught of sea-going vessels.

II. Government aid should not be extended to the building or operation of sea-going vessels whose draught exceeds 9.5 meters (32.2 feet).

III. There should be an international agreement fixing the maximum dimensions of sea-going vessels built or op-

erated under government subvention, and there are tentatively suggested the following:

Length over all: 955 feet (275 meters).
Breadth: 105 feet (32 meters).
Draught: 32.2 feet (9.5 meters).

IV. Any maritime canal which has locks with a usable length of 1,000 feet (305 meters), a width of 110 feet (33.6 meters) and a depth of water on the sill of 35 feet (10.7 meters) will fulfill every reasonable requirement of commerce.

V. In a maritime canal a wet section 5 times as large as the immersed portion of the largest ship which is to use the canal is desirable, as also a depth of one meter under the keel; but these values are functions of the speed at which the canal is to be navigated and therefore to some extent also of the volume of commerce, and are to be determined by local conditions.

It remains to be stated that the largest vessels on such special routes as the one between New York and European ports stand apart in a class by themselves, and their dimensions need not be taken into account in forecasting the dimensions of the vessels for whose use the great maritime canals such as the Suez Canal and the Panama Canal and other canals of the first rank are constructed.

A Common Language of Commerce

BY W. R. DAINGERFIELD

(The world is eagerly seeking new methods which will make easier the understanding between peoples. Well-concerted efforts are being made to assist the interchange of ideas among commercial and technical men of every land through Esperanto. One of the able spokesmen of this movement, Judge Daingerfield, is writing an instructive series of articles thereon especially for the Journal of Electricity.—The Editor.)

The Esperantists are renewing their activities since the close of the war. For some years their trend of effort has been mainly the establishment of groups of enthusiasts, who studied the language and corresponded socially with members of other groups in distant lands. Gradually these groups have established larger central representative groups, in provinces, in states and as national organizations. Thus the Esperanto Association of North America has its headquarters at West Newton, Massachusetts; the Kalifornia Rondero, representing the groups in California, has its headquarters at 946 Central Avenue, San Francisco; the Universal Esperanto Association is at 14 Museumsstrasse, Bern, Switzerland; and the office of the Common Commercial Language Committee, very recently organized, is at 211 West 138th Street, New York City.

Organization of Esperanto Forces —

The latter organization is a practical departure from the desultory methods of the past. The Common Commercial Language Committee expects to profit from the experience of similar organizations in England, Italy, Japan and other countries, by which substantial results have already been obtained. It renders services to all business men, and demonstrates to them that Esperanto is capable of meeting their real needs. It works in harmony with the West Newton and Bern organizations, but does not duplicate their work.

The West Newton organization is mainly for propaganda. It aims to introduce Esperanto into schools, and to encourage its use in literature and science. The Bern organization is international, and furnishes information to its members and aids them in travel. It has representatives in about 700 cities throughout the world. It is not a propaganda organization, though indirectly it exerts a strong influence in that direction.

The New York organization translates catalogs, price lists, circular letters and advertising matter into Esperanto, and circulates them in any country desired. It also translates from or into Esperanto any letter or document submitted. It secures agents and correspondents for every lawful purpose everywhere in the world, obtains trade information and other information from any country. Reasonable charges will be made for these services, with a view to bringing the Committee to a self-supporting basis.

Devising the Technical Vocabulary —

The naming in Esperanto of the various articles of trade, and of things that characterize a science, art or business, is an important and arduous task, but it is in a great measure lessened by applying one of the rules or principles of Esperanto, namely, that roots already common to at least a few of the leading European languages are ipso facto Esperanto roots, suffering no change except to conform the roots to the system of phonetic spelling characteristic of the language. When a nation is specially distinguished in some particular field—as the English in navigation, the French in the dry goods trade—the tendency of the Esperanto lexicographers is to prefer the selection of roots from the language of the nation making a specialty of the art or business concerned.

In the modern sciences the vocabularies of the national languages are very much alike. Esperanto strives to be international in its choice of words, and therefore its scientific terms are made as a rule from roots common to French and English. The readers of the Journal of Electricity will have no difficulty in recognizing such Esperanto words as elektro, aparato, poluso, aero, oksigeno, hidrogeno, galvana, galvanizi, galvanometro, tensio, farado, volto, ampero and magneto.

The technical dictionary of Charles Verax, published in 1910 in Paris by Hachette & Co., is the one mainly in use. Its definitions are in Esperanto, with the French equivalent for every term.

Importance of a Neutral Trade Speech —

When a national language becomes commercially important, like English, it tends to spread and is taught in foreign countries. It becomes a part of their school curriculum. But no such language can become international in any broader sense. National jealousies prevent. The other nations would never permit one living national language to dominate thus, over all others.

Now, no dead language is fit for modern uses. Hence the international language of commerce is to be a neutral artificial language or none. If such a language turns out to be more readily learnable than any national language, and at the same time fit for the scientist and literary man, so much the better. It is claimed that Esperanto fulfils these requirements, and has stood all tests.

From time to time short technical articles, as well as those on international subjects, will appear in the Journal of Electricity, in parallel columns with the English translation. This will present to the eye the conciseness of Esperanto, as each paragraph of the language will be printed alongside its translation. The student will thus gain a vocabulary with less effort than is ordinarily required.

Simple Grammar to be Presented —

In the short Esperanto grammar which is to be published in instalments in the Journal of Electricity, special attention is to be given to matters as to which English-speaking persons are likely to blunder. In certain respects the English language stands aloof from the languages of continental Europe. For example, the so-called English "long" sounds of the vowels, **a, e, i, o,** and **u,** if found at all in a Continental language, are represented by letters that are different from the English. On the other hand, the Continental languages are almost uniform in having as fundamental vowel sounds the sound of **a** in father, of **e** in met, of **i** in regime, of **o** in not, and of **u** like oo, in food. Furthermore, the English **j, q** and **w** do not closely resemble the corresponding consonants in other languages when such consonants appear. The result of these differences is to make a Continental language hard at first for an English-speaking learner to pronounce, while the Continentals have much less difficulty in this respect in learning one another's languages.

Other points of special difficulty to English-speaking learners who have never studied any foreign language will be mentioned during the course.

The Flexible Word-Order —

To be a good commercial language Esperanto ought to be so flexible and so cosmopolitan as to admit of almost any word-order, because the various languages do not have the same order of words. In English we say, "I have seen him." In French they say, "I him have seen." In German they say, "I have him seen." In Esperanto we say, "Mi lin vidis," "Mi vidis lin," or even "Lin vidis mi." "Li" means "he," and the letter **n** shows the accusative case, which in English we express by the word "him." To change the word-order creates confusion with most modern languages. But modern Esperanto, like ancient Latin, has great flexibility, and retains the same meaning whether one says, "Mi vidis lin" or "Lin vidis mi."

This is a valuable point in a commercial language; for, by using or listening to the Esperanto accusative **n,** one avoids the necessity of knowing the rules for word-order in the national language of the person with whom one talks, or of having rigid rules for word-order in Esperanto.

THE FOREIGN TRADE CLUB OF SAN FRANCISCO

(Nearly all our Pacific ports have organizations for promotion and study of overseas commerce. The following account of the activities of the Foreign Trade Club indicates the progressive manner in which these business bodies are advancing American interests.—The Editor.)

One of the vital forces in the commercial life of the Pacific Coast is the Foreign Trade Club of San Francisco. Through the aggressive attitude it has taken in behalf of American interests in the Pan-Pacific area, much good has been accomplished for our overseas trade, and every effort of this organization is directed to placing our sea-borne commerce on such a solid foundation that it cannot be shaken by changing world conditions.

The Foreign Trade Club, composed of representative exporters, importers, shipping and marine insurance men of San Francisco, is organized for the purpose of acquiring in a practical way accurate knowledge of the essentials of overseas commerce development.

Formed May 6, 1917, with a nucleus of thirty, it has now grown into an effective organization of five hundred members.

The Foreign Trade Club aims to develop a happier feeling of mutual confidence and esteem among all exporters and importers who visit our shores—to dissipate international prejudice and reveal to all foreign traders the spirit of fair play characteristic of American commerce. It seeks to indelibly impress on future overseas commerce the highest ideals of the age as exemplified by American principles of honor and democracy.

The constructive work of the club has included a very valuable lecture course, which is believed to be more comprehensive than any program undertaken by similar organizations. Every phase of international commerce is covered by the lecture schedule, which specifically indicates the necessary procedure in developing trade with each group of world markets. The lectures are delivered by recognized authorities in their particular fields, and at each meeting the members are privileged to listen to remarks from world merchants who are passing through San Francisco. In no sense is the information presented in an academic way; it is put forward with the world viewpoint always to the fore, and in that practical manner which will best prepare the members for the keen competition now prevalent throughout every trade field.

In explaining the significance of the work which the club is doing, President William H. Hammer points out some salient facts as to the present world trade situation, particularly affecting the United States. "America is at last awakening," he says, "to the urgent necessity of thoroughly training her young men for foreign trade service, and this vital measure for the future commerce of the nation is now recognized by the Federal Government. The study of the essential underlying principles of foreign trade is now being constantly urged by Government authorities.

AIRPLANE VIEW OF THE SAN FRANCISCO WATERFRONT

The Pan-Pacific countries undoubtedly represent the field of most rapid development in the world today. China newly come to life, growing Japan, Latin America, and the Western Coast of the United States itself, are working out problems on a new scale and putting forth ideas along technical, social and even international lines which promise to wield important influence in world developments. The electrical industry has an especially significant role to play in making possible the growth of this great area, in fact, upon its development in large measure is dependent the prosperity and advance to which this region looks forward. It is highly appropriate that the Foreign Trade Convention of next year should be held in San Francisco, May 12th to 15th, 1920, to consider the "Problems of the Pacific."

"Exact knowledge of the requirements of foreign commerce is daily becoming more essential, and the successful world trader is equipped with a practical knowledge of the trade conditions prevailing in all countries.

"We shall have an enormous American merchant fleet of approximately 25,000,000 tons at our service after normal conditions are restored, and the call has been sounded to all patriotic Americans to prepare now that we may keep these vessels and the Flag afloat on all the trade routes of the world.

"The facilities of practically every manufacturing plant in the country have been expanded far beyond the normal capacity required for domestic consumption. It is obvious that an overseas market must be found at the end of the war for the surplus output of products of all kinds or the manufacturing interests will suffer tremendous losses.

"The members of this club deem it a patriotic duty, as well as of material personal interest, to supplement the work being promoted by the United States Government, to establish and make permanent, as well as reciprocally beneficial, the foreign trade relations of this country with other nations."

Commercial and political geography, salesmanship, advertising in the world trade field, commercial policies, diplomatic and consular practice, transportation and communication—all these are taken up in the addresses before the regular Wednesday evening meetings of the Foreign Trade Club, held in the assembly room of the Merchants Exchange building. But, as has been indicated, the activities of the organization are by no means restricted to educational effort. A strong stand has been taken in favor of securing more ships for Pacific ports, in advocacy of the metric units of weight and measure (meter-liter-gram), and upon many other problems affecting world trade.

An annual dinner is held by the members of the club, and this is truly a unique feature of the organization. It is a rule that the banquet must be held aboard ship, and this year the annual affair is to be given on the splendid trans-Pacific liner, Tenyo Maru, early in November. Only members are gathered at these banquets, as there is a waiting list for reservations.

The officers of the Foreign Trade Club of San Francisco are: President, William H. Hammer; first vice-president, E. W. Wilson; second vice-president, E. G. Babbitt; third vice-president, C. E. Hydes (in charge of the educational lecture series); secretary-treasurer, William E. Hague.

LOCATING OIL BY ELECTRICITY

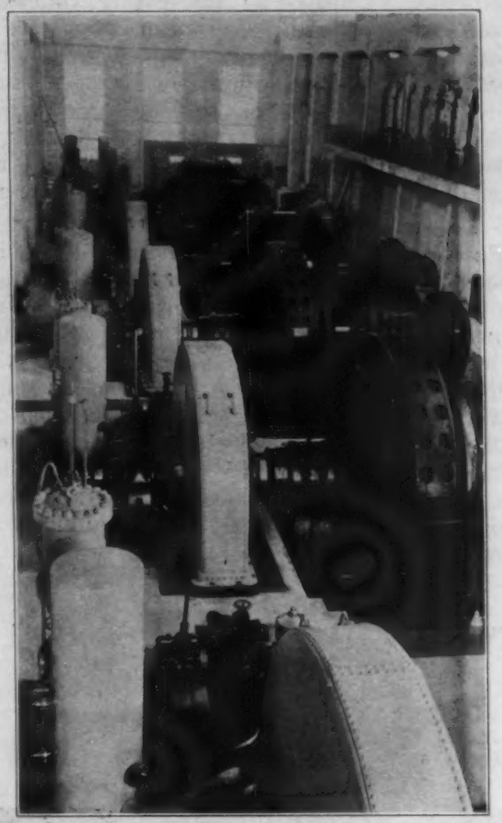
Oil is being located in Texas fields by means of an electrical device, based on the fact that oil and its constituents are the only minerals in the earth through which electricity cannot pass. An electrical circuit is formed by dropping an insulated wire to the bottom of a dry water hole, placing a series of batteries on top of the earth and attaching a land wire to the positive pole. The land wire is then taken out over the field in any direction and the territory thoroughly covered with electric currents flowing from the positive to the negative pole. An oil pool in the path of the current will force it to go around, and will also result in an appreciable current loss. Both these facts are registered on a delicate meter in the hands of the operator.

Hydroelectric Installations in Norway

BY CHAS. H. TALLANT

(The varied requirements of hydroelectric installations have caused important and rapid development in hydraulic units. Interesting examples of the flexibility and efficiency obtainable are afforded in this account of two Norwegian plants in which a Pacific Coast turbine has established a rather unusual record.—The Editor.)

War conditions are happily responsible for a hydroelectric installation that furnishes forcible evidence of the flexibility possible in hydroelectric generating units. The installation is that of the electrolytic furnace plant of the Norsk Aluminum Company, Hoyanger, Norway, where 7—4500-hp. Pelton impulse turbines, direct connected to 10,000-amp., 300-volt direct current generators, furnish the primary power. The interesting feature of the installation is the provision made to operate one turbine on either of two heads, 1800 feet and 2400 feet, at will.

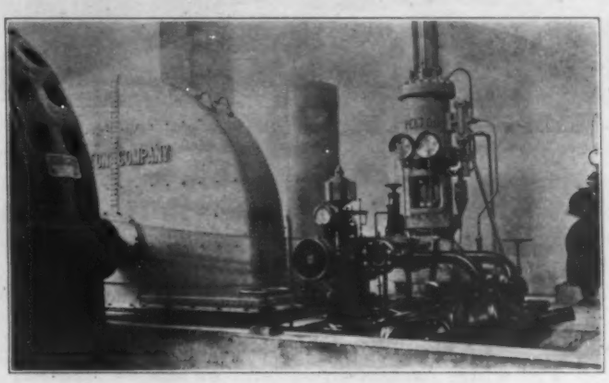


View of the installation at the Norsk plant showing all the seven units. Three of them are connected to the 1800-ft. head line, three to the 2400-ft. head line, while the remaining one is interchangeable and is tied in on both.

Reorganizing Units —

The original plans for the plant called for duplicate individual units, each to consist of one hydraulic impulse turbine direct connected to a d.c. generator, and a single bank of furnaces. Each bank of furnaces was to receive power from its generator on an individual circuit. The furnaces were to be used for the electrolytic reduction of bauxite. A shortage of bauxite due to the war forced the company to the expedient of producing carbide and reducing iron ore if the plant was to continue in operation. For such service lower voltages are used and this called for a complete alteration of the unit relations of generators and furnaces.

The revised plans necessary to meet these conditions provided for two groups of four banks of furnaces each, to draw current from a single main bus. The four banks of furnaces are connected in series, while the bus is fed by all the generators connected in multiple. The normal load of one group of four furnaces totals the normal output of three of the generators, but the group may be operated on the output of two generators in emergencies. This obviously calls for the continuous operation of at least two turbines per group.



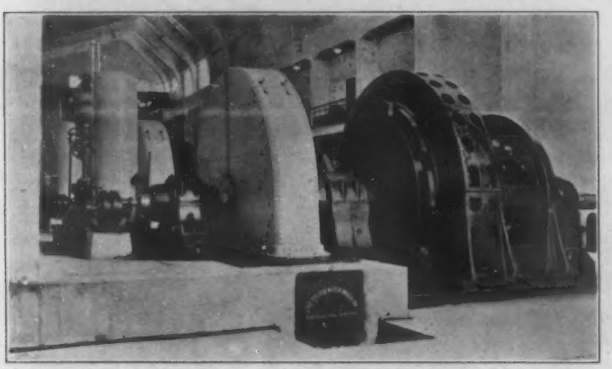
View of the governing apparatus at the Norsk plant. Each governor is supplied with oil by an individual pump, direct connected to the main shaft of its own unit.

Interchangeable Operation —

Two storage lakes, at different elevations, are the sources of the water supply, each normally to supply water for three turbines. The lower lake discharges into a 4000-foot penstock and develops an effective head of 1800 feet at the power plant. The higher of the two lakes, discharging into a 7000-foot penstock, will develop a head of 2400 feet, effective. To develop economical plant operation and to permit the shutting down of one or the other of the main water lines at any time, it was decided to tie on one turbine into both water lines, through tees and gate valves, this interchangeable unit to be capable of operating under either head. Three turbines are connected through a simple manifold to the 1800-ft. head line, three to be connected similarly to the 2400-ft. head line and the interchangeable unit to be tied in on both. The interchangeable unit normally will be idle, it being held in reserve in case it is necessary to shut down either of the main water lines, or any other individual turbine. Water was let into the machines in April, 1918, for testing, and the load was put on the following month, in actual plan operation.

One other interesting feature of the installation which developed was the behavior of the units on

reduced voltages. When changing electros, voltage is reduced on the bus to 60 volts, each generator taking its equal share of the load. The governing and regulation of the turbines is so exact that this voltage is held steadily, in spite of the decided unstable tendencies of the generators at the reduced voltage. The governing mechanisms consist of Pelton direct motion oil pressure governors and auxiliary relief regulating nozzles. Each governor is supplied with oil by an individual pump, direct connected to the main shaft of its own unit.



One of the units of the Norsk installation. When changing electros, voltage is reduced on the bus to 60 volts, each generator taking its equal share of the load.

The water control equipment of the installation is decidedly important and necessarily very complete with such a high head. At the penstock, automatic, self-closing butterfly valves are installed, capable of closing automatically if the water velocity in the pipe exceeds the limit fixed by the maximum demand of the turbines. In normal operation, however, these valves are opened and closed electrically by remote control from the plant. Indicators on the main switchboard show the positions of the valves continually. The main gate valves at the turbines are hydraulically operated and built sufficiently strong to allow of their being opened or closed under full pressure, if necessary. (This feature was successfully tested after the water was let into the line.) The main gates are further equipped with emergency shut-down electric control to be operated from the switchboard, and with emergency manually operated control.

Economy of Space —

An installation by the same manufacturer at the electrolytic plant of Tyssefaldene Company, Tyssedal, Norway, furnishes an interesting comparison between American and European practice. The Tyssedal plant was originally designed for a number of moderate-sized turbine units of European manufacture, arranged to utilize the floor space with ample room between adjacent machines and walls, and at one end of the plant a small space was left, large enough to take a small unit, though none was planned for it.

Production demands increased rapidly and developed a need for 10,000 additional horsepower. The improved design which has been developed by American practice made it possible to install a 10,000-hp. unit in the small space which had been left and which could only accommodate a European unit of half that capacity. The American unit consists of a 10,000-hp., 1300-ft. head single overhung Pelton impulse turbine, direct connected to a Westinghouse direct current generator, and is used with the other machines for carbide, ferrosilicon and aluminum production.

Using the Manufacturer's Literature

BY HOWARD ANGUS

(The contractor-dealer frequently does not use to best advantage the literature supplied by the manufacturer. Here are a few of the ways in which it may be made to carry its message to the customer, summarized by the secretary of the California Electrical Cooperative Campaign. —The Editor.)

The Hartwell Electric Company of San Diego finds that some of the advertisements sent out by manufacturers make excellent pictures when framed, and will catch the customer's eye.

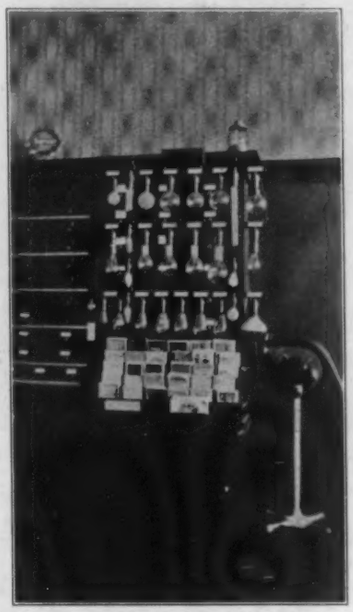
Framing advertising material and placing it in well-selected corners can have excellent results, as here where Snyder & Bell of San Bernardino use a mirror to double the effect.

Manufacturers' literature is worth a great deal to manufacturer, jobber and contractor-dealer if distributed to the public, and is only scraps of paper if allowed to lie around idly. The entire electrical industry is interested in the distribution. The field representatives of the California Electrical Cooperative Campaign have worked out several plans to get this literature to the public.

The Reynolds Electric Company of Santa Barbara maintains a neat and attractive rack for manufacturers' literature in a conspicuous place where the customer cannot fail to see it and where it is conveniently at hand for distribution.

A wall in the establishment of the San Diego Gas and Electric Appliance Company, San Diego, showing the highly artistic effect obtainable by framing these small colored posters and using them to adorn an otherwise bare wall.

Probably the most novel way is using the large manufacturers' posters as pictures and hanging them on the wall in frames made out of paper moulding. This serves two purposes—advertisement and decoration. The pictures are attractive, and make



A rack of the "please-take-one" variety is used by the Hartwell Electric Company of San Diego to promote the distribution of the smaller type of literature supplied by the manufacturer.

a blank wall look like a picture gallery. Many an unsightly wall has become an asset to the store because of these pictures. They are of advertising value, and each tells its story to every person entering the store.

Another method of distribution used with considerable success is a rack on the counter in which the manufacturers' literature is neatly arranged and from which the customers can help themselves. Two kinds are used, a wood case and a postcard rack. Both are very inexpensive to make. Both have worked very successfully.

Another method of distribution used with great success is wrapping literature in every package sold. The theory is that anybody buying an electric appliance, device or lamp is a prospect for something else electrical. The dealer is certain that the literature will get into the customer's home. Tests have proven that the literature is read and many purchases have been traced directly to this method of distribution.

Some dealers use their mailing list of prospects with great success. Somebody has been in the store inquiring about some appliance or device. The dealer secures the name and mails them whatever literature he may have. When he wires a house, he follows his job up with literature of various appliances and secures the appliance business as well.

Some dealers keep a careful list of all customers making purchases and the articles purchased and from time to time mail literature on other appliances and devices. A wide-awake dealer secures a list of many prospects in many ways and mails literature to these, following up his letters and literature by calls from his solicitor.

Some dealers secure a boy to distribute their manufacturers' literature from house to house after school hours.

All these methods of distribution have been tried and proven successful. Many dealers in California are using one or two of these methods. Some all of them.

ARE YOU MAKING PLANS FOR CHRISTMAS?

The November 15th issue of the Journal of Electricity will contain many Christmas ideas, and will feature the newest schemes for washing-machine campaigns.

If you are looking for ideas to help you make this year's holiday a record

All-Electrical-Christmas

watch for these articles:

- Christmas Windows Which Have Brought Results.
- Shop Early Christmas Plans.
- Suggestions for Christmas Merchandising.
- Putting on a Washing Machine Campaign in Utah.
- Methods of Washing Machine Merchandising in the Northwest.
- The Idea of the Washing Machine Service Station.

PRACTICAL LESSONS IN ELECTRICITY

BY H. H. BLISS

(Service is the ultimate standard by which the value of all human undertakings is measured up. The following article, the last of the series published in connection with the Extension Divisions of the Universities of California and Washington, presents the science of electricity from this standpoint, with the three great mediums — cooperation, safety, progressive study— through which the industry is endeavoring to render better service to the public.—The Editor.)

A meeting of the California Electrical Cooperative Campaign in San Francisco. This energetic organization is doing most effective work in spreading the electrical idea and in inducing each branch of the industry to cooperate with all the others for a common end—better service to the public and the mutual benefit which will accrue from an ever-increasing use of electricity.

INCREASING EFFICIENCY IN THE ELECTRICAL INDUSTRY

"Efficiency" is a word referring to the ratio between "output" and "input." An improvement in efficiency means the increase in return for a given input of effort, and the purpose of this paper is to indicate possibilities of such an improvement for the benefit of those engaged in the electrical industry.

The first point to bear in mind is that each electrical worker receives benefit, directly or indirectly, from everything which improves the industry as a whole. Therefore all movements toward raising the standard of service and enhancing the dignity of the electrical business should receive the enthusiastic support of every person in any way related to the business.

Erroneous ideas exist in the public mind regarding many phases of the electrical industry. It is worth patient and persistent effort to correct these and inculcate a feeling that the work of electrical men is of an importance and dignity certainly as great as that of any other industry whatever. It rests upon the most advanced scientific research, it requires accurate technical knowledge, and it serves in ever increasing measure every civilized man and woman and child in the world.

It takes but little effort to speak favorably and enthusiastically of one's employer or company or of other concerns in related lines of work. It doesn't pay to "knock" even competitors—some of the most successful electrical men make it a practice to praise them—and it pays still less to speak slightingly of one's own organization. The employes of power, telephone, traction and other public utility corporations have continual opportunity to present to their friends and to the public in general facts and ideas which will produce a better understanding of utility problems and greater sympathy and respect for the companies. Employes have "inside information" regarding problems and difficulties of which the public should know in order to appreciate the service it receives and to use with moderation and justice its powers of regulation. It must never be forgotten that one's success is bound up with that of one's company and of the industry in general.

California Electrical Cooperative Campaign.—In the state of California the whole electrical industry has achieved successful organization for the betterment of its service and the consequent improvement of conditions for all. The emblem adopted symbolizes the four great branches of the business—manufacturers, jobbers, central stations and contractor-dealers—connected by the campaign into a unified force for better service. The means adopted are cooperation and education; cooperation between the four branches and between the members of each branch, and the education of each member for more effective work and of the public to the value of electric service in all lines.

Emblem of the California Electrical Cooperative Campaign

The major share of the work of the campaign is carried on with and for the contractors and dealers, for they form the largest class of members and the one most closely in contact with the public. Dealers are assisted in obtaining the best locations for their stores and in making them attractive and of service to the public. Rival dealers are shown how to cooperate with one another and competition becomes constructive instead of destructive. Advertising and selling campaigns are planned and carried out, with the help of power companies, jobbers and manufacturers.

The ideals of service underlying the campaign are suggested in this statement of policy: "It is recognized that the practice of proper accounting, of other good business methods and of good business ethics will result in companies and individuals being able to ask for their goods and service a price that will include a fair profit, and we hold that such exchange of goods, service and ideas for profit is legitimate and ethical, provided, that all parties in the exchange, including the customer, are benefited thereby.

"It is expected that the adoption of good business methods will also so increase the efficiency of the various branches of the electrical industry serving the public, that it will enable our industry to give the customer a better value for the dollar he spends for electrical service."

Industrial Accident Commission.—To prevent accidents from electrical apparatus the Industrial Accident Commission of the state of California has promulgated two sets of "Safety Orders," one applying to power stations and the other to electrical utilization in dwellings, vehicles, factories, stores, hotels, theatres, and other places of employment. A copy of either set of safety orders may be obtained free of charge by applying to the Commission, Underwood Building, San Francisco.

It is important that every man having to do with the installation of electric wiring or equipment should know and keep in mind these safety orders as well as the requirements of the Underwriters' Code. Contractors in particular should understand clearly every point, and the Commission stands ready to give explanation and instruction to this end.

Attempts are sometimes made to lower costs by installing equipment which fails to come up to the requirements of the Safety Orders. Such action injures the public, the owner of the installation, and his employes, and hurts other contractors who are defeated by unfair competition. It lowers the prestige of the electrical industry and is thus an injury to every member of it.

Installations of good material which are made safe from fire and accident hazard cost more than others, and it sometimes requires tact to convince the man who pays for it that safety is worth what it costs. It is generally found, however, that the owner is more willing to do the right thing than some of the intermediaries between him and the contractor.

One California manufacturer recently built a new factory and was persuaded to have an electrical installation strictly in accordance with safety rules. Although he had at first objected strenuously to the expense, he was immensely pleased when he saw the results. "That high class equipment is the best investment I ever made," he said. "I get 18% interest on it in the saving in insurance, compared with the old factory." Construction up to standard benefits the owner, his employes, the contractor and the electrical industry in general.

Technical Study and Reading.—To get the maximum return for one's effort it is necessary to possess a trained and effective mind. Hence technical education is an important factor in personal efficiency. Polytechnic high schools, colleges and universities offer technical education to those who can spend their full time for several years in this sort of preparation, while those who must "earn while they learn" have excellent opportunities in evening public and private schools, commercial correspondence courses and in University Extension class and correspondence instruction. Hundreds of courses are offered by the Extension Division of the University of California alone. The correspondence instruction is available to everyone, whether a resident of the state or not. Many other universities have extension departments, and anyone who desires self-improvement may obtain valuable information by addressing inquiries to them.

Education for efficiency is a continuous process, and it does not end at the conclusion of a single course. Readers of this series are urged to make it a practice to read regularly and carefully every copy of the Journal of Electricity. It is well to subscribe for and study such magazines as the Electrical World, Electrical Merchandising, the General Electric Review, the Electric Journal, etc., making the selection in accordance with one's branch of work and amount of technical preparation.

Books should be bought, studied and kept for reference by everyone in electrical work. Numerous excellent works on technical subjects are published by the McGraw-Hill Book Company and John Wiley & Sons (both of New York City) and the Technical Publishing Company of San Francisco. Lists of

books dealing particularly with the branches in which one is interested are obtainable from these publishers on request. Among the books especially valuable for persons who have been studying this series of lessons in electricity may be mentioned Terrell Croft's "Practical Electricity," "Electrical Machinery," and "Practical Illumination"; Alexander Gray's "Principles and Practice of Electrical Engineering;" C. M. Jansky's "Electrical Meters," and W. H. Timbie's "Essentials of Electricity." The last is published by Wileys; the others by McGraw-Hill.

In reading books and periodicals one should not hesitate to read chapters and articles which seem difficult to understand, if the subjects are interesting. It will be found that power to assimilate such material is acquired almost unconsciously, and that things not fully understood become clear in the light of later study.

One should read regularly, daily, and with economy of effort, keeping always in mind the central thought of the article. Practice of this kind will develop the ability to obtain the greatest possible amount of knowledge for the amount of effort which can be devoted to study.

ELECTRIC UTILITIES OF CALIFORNIA

(The following inclusive and accurate data regarding the electric systems of California has been especially furnished to the Journal of Electricity by the California State Railroad Commission. — The Editor.)

There are eighty-four electric utilities in the state of California, operating seventy-five hydroelectric plants, with an installed capacity of 465,000 kilowatts, and fifty steam plants with an installed capacity of 305,000 kilowatts, making a total of one hundred and twenty-five plants, aggregating 770,000 kilowatts.

During the year 1918 these plants generated a total of 2,892,000,000 kw-hr., of which 2,163,000,000 kw-hr., or 75% of the total, were produced from water power.

This power is transmitted through 7,300 miles of high tension transmission lines to points of distribution, from which 84,000 miles of secondary distribution lines extend. Electric service is supplied to 545,000 consumers.

The following statement summarizes the revenues and operating expenses of all California Electric Utilities for the year ending December 31, 1918:

Revenues:	
From Municipal Lighting	$ 1,756,000
From Residence and Com'l Lighting	12,793,000
From Sales to other Electric Utilities	3,681,000
From Power	20,582,000
Miscellaneous	740,000
	$39,552,000
Operating Expenses: (Including Maintenance and Repairs)	
Production Expenses	*$10,114,000
Transmission Expenses	741,000
Distribution Expenses	2,721,000
Commercial Expenses	1,568,000
Gen'l and Miscellaneous Expenses	1,788,000
Other (Mdse., Steam Sales, etc.)	605,000
Taxes	2,600,000
Depreciation	2,445,000
Total Operating Expenses,	$22,582,000

*Of which 4,742,000 was for fuel oil, and $2,853,000 was for purchased energy.

The installed capacity of consumers' lights, motors and other power-consuming devices exceeds 1,800,000 horsepower. Nearly 900,000 kilowatts of distribution transformers are installed on these systems.

Past Growth and Future Estimates, Northern California —

The following figures for the years 1915-1918 inclusive are based on the actual output of the five principal systems supplying Northern and Central California.

The figures given for 1919-1922 inclusive are estimates of the necessary output and peak load of these systems to fulfill the growing demand for electricity in Northern California.

	Millions of Kw-hr.	Peak Load in Kw.
1915	1,220	220,000
1916	1,360	240,000
1917	1,510	260,000
1918	1,680	300,000
1919	1,850	340,000
1920	2,050	365,000
1921	2,250	400,000
1922	2,450	445,000

For the territory supplied by these five companies alone, it is estimated that additional generating facilities must be provided at a rate of not less than 30,000 kw. per annum, which will entail expenditures of at least $5,000,000 per year for power stations and transmission facilities alone. This does not take into account an equally large expenditure for distribution and other facilities necessary to deliver this power.

Developments Now in Progress —

At the present time there are under way hydroelectric developments and transmission line construction in California which total an expenditure of $22,000,000 and will render available within two years an additional 120,000 kilowatts of generated capacity.

The four main projects under way are the construction of the Caribou Plant of the Great Western Power Company on Feather River, which is now being installed to a capacity of 40,000 kilowatts, although much of the hydraulic construction is sufficient for the ultimate installation of 120,000 kilowatts.

The San Joaquin Light and Power Corporation is making rapid progress on its new Kerckhoff Plant, which when completed will have an installed capacity of 30,000 kilowatts.

The Southern California Edison Company is building a 30,000-kilowatt plant, to be known as Kern River No. 3, and the City of Los Angeles is now working upon an additional power plant, utilizing the waters of the Aqueduct in a drop in San Francisquito Canyon. This plant will be of 20,000-kilowatt capacity.

In addition to these new generating plants, several hundred miles of high tension transmission lines, operating at 110,000 to 150,000 volts, are now under way.

SPARKS—Current Facts, Figures and Fancy

(Solving the street car fare problem by abolishing fares, meeting the difficulties of transporting mine machinery in Mexico by using aeroplanes, and discovering insulation defects before using by the use of the X-ray are among the week's suggestions. No remedy is proposed for the spiders of Argentina, however—and the complications of the French labor problem present elements of the impossible.—The Editor.)

The investment in electric railways of this country amount to $6,000,000,000, according to statistics submitted to the Federal Electric Railway Commission.

* * *

According to recent figures in a Japanese newspaper, 96,000 out of 125,000 employes in 42 spinning mills were women, some 5,000 of these being under fourteen years of age.

* * *

Thursday, October 21st, was the 40th anniversary of the incandescent lamp. It was on October 21, 1879, that Thomas A. Edison took out the first patent on his incandescent lamp.

* * *

It is reported that when the Germans proceeded to reconstruct certain parts of French territory, in accordance with the requirements of the peace treaty, the French labor unions protested against "cheap foreign labor" and demanded that the German receive the same wages as themselves.

* * *

More than thirty miles from the nearest railway station, on the shore of Richardson Lake in Maine, is an isolated telephone pay station. Numbers of emergency calls have been turned in over this telephone which has been the means of saving the lives of many hunters and woodsmen injured in this region.

* * *

Somebody in England has realized that the audience is half the fun in a theatre, and is planning to have a mirror drop curtain so that you can study the dress circle from the orchestra without turning your head. The curtain will be raised and lowered by electric power, and will have air cushions to prevent jarring when the curtain touches the stage.

* * *

Most people take a morbid delight in statistics on the high cost of living these days. Here are some: The cost of living has gone up 102% in the United States, 107% in Canada, 133% in England and 200% in France since the beginning of the war, according to the results of an investigation just completed by economists of the War Trade Board.

* * *

Spiders are responsible for quite a number of troubles on the telegraph lines in Argentina and Brazil. The ground spider spins a heavy web which the wind wraps around the wires in great masses, and when these become damp, short circuits are formed. Trouble men are obliged to follow the wires across the country and remove the webs. Of course the spiders they grow in South America are not the small and harmless insects to which we are accustomed.

* * *

A silent alarm clock is a new invention which will appeal to anyone who sleeps across the hall from a commuter. It consists of a nitrogen tungsten lamp of high wattage mounted within a reflector and adjusted near the bed so that the light falls on the pillow. The light is controlled by a time switch or by an alarm clock arrangement which turns on the current at the set time.

* * *

The X-ray has been found very useful in the examination of timber up to 18 in. thick. Internal knots, rosin pockets, cracks and grub holes can be easily detected—an invaluable aid in aeroplane construction. Another important use of the X-ray is in ascertaining the purity of insulating materials for electrical use. Small metallic specks in fibre or mica, for instance, can be detected instantly.

* * *

A new fire hazard was recently discovered in a grain elevator. After three fires had occurred in the same elevator in one day, investigation showed that wheat dust collecting on an ordinary 16 candlepower, 55-volt incandescent lamp ignited, fell to the floor and set fire to the litter. The defect was corrected by the installation of double globes which reduce the heat slightly without marring the light.

* * *

A proposal has been made in Mexico that an air service should be operated between certain mines and stations for transporting machinery and supplies to the mines and returning from the mines with bullion and ores. Nearly all the mines are located in the mountains, and it is almost impossible for the companies to get in any machinery which is too heavy to be transported on the back of a burro. The principal drawback to the air service plan would be the establishment of suitable landing places.

* * *

The latest solution of that all-absorbing problem, street car fares, is to abolish them entirely. A suggestion has been put forward that cities should run street cars just as owners of skyscrapers run elevators, with no charge to the passengers, and that the business community should be glad to pay the expense. The suggestion argues that if it is good business for the public to take toll off roads and bridges and spend tremendous sums in maintaining them for the use of the people, it is better business to take over the moving highways, the service being more a social than a transportation problem.

PERSONALS

C. F. Uhden, of Spokane, has been selected to have charge of the proposed hydroelectric development on the Skagit river for the city of Seattle. He will have full charge of all the engineering details and work is to be started in the near future. Under the provisions of an ordinance passed in September by the Seattle city council authority was conferred upon the board of public works to draw plans and specifications for the construction of a power plant at or near the mouth of Gorge Creek, capable of developing 50,000 horsepower of electrical energy. Preliminary work has already been done on the project which is estimated to cost of $5,500,000. Much confidence is being expressed in the ability of the city of Seattle to put this splendid new plant into operation at an early date under the constructive vision of Mr. Uhden.

C. V. Schneider, electrical contractor at Sacramento, California, is roughing it in the high Sierras.

E. C. Mixer, who has been in the electrical business in Modesto, has opened a new store in Lodi, California.

James W. Fenwick, assistant manager Hawaiian Electric Co., Ltd., of Honolulu, is a recent San Francisco visitor.

F. J. Zorn, manager of the Pacific States Electric Company at Seattle, spent a few days recently in Bellingham and vicinity.

George H. Kuhrts, general manager of the Los Angeles Electric Company, is among recent notable visitors to San Francisco.

James Lyman, an electrical engineer with Sargent & Lundy, mechanical and electrical engineers of Chicago, is a recent San Francisco visitor.

S. Herbert Lanyon, sales engineer at San Francisco, has been appointed Pacific Coast representative of the Lapp Insulator Company of Le Roy, N. J.

John J. Gibson, manager of the supply department of the Westinghouse Electric & Manufacturing Company of East Pittsburgh, is a recent San Francisco visitor.

Louis A. Lewis of the commercial department of the Washington Water Power Co., has been appointed secretary of the Northwest Light and Power Association.

Miles F. Steel, Pacific Coast manager of Benjamin Electric Company, is again at San Francisco after a trip to Chicago, from which he returned via Seattle and Portland.

Barney Badrian, for four years Western traveling salesman for the Hurley Machine Company, has been appointed district manager by that company for the Pacific Coast district.

C. E. Heise, San Francisco manager of the Westinghouse Electric & Manufacturing Company, is back again in his San Francisco office after an absence of several weeks in business centers of the East.

Orville R. Graves, previously with the San Francisco office of the Pacific States Electric Company, has been transferred to the Seattle office of the company, taking a position in the sales department.

C. M. Lindsay, advertising manager of the Edison Electric Appliance Company, Inc., with headquarters at Chicago, has resigned to become associated with the advertising department of the Journal of Electricity and Electrical Merchandising.

Alfred G. Potts, sales engineer with Gunn, Carle & Company, San Francisco, has been spending some time in Los Angeles. While there he visited the Southern California Edison Company's establishment.

Donald I. Cone, electrical engineer with the Pacific Telephone & Telegraph Company, announces the arrival in his family of Ruth Dorothy on October 10th. The Journal of Electricity offers its congratulations.

M. S. Vittenberg, manager of the Tomsk (Siberia) branch of the Russian General Electric Company, has come to the United States for an extended business tour. He will return to Siberia by way of San Francisco.

W. T. Andrews, who for twelve years has been connected with the forest service in the Northwest in the capacity of logging engineer, has resigned to become forest evaluation engineer for the Bureau of Internal Revenue.

John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, has returned to his San Francisco office after an absence in the East of some weeks in the interest of public policy activities for the N. E. L. A.

F. D. Egan, former works manager of the Pittsburg Iron & Steel Foundries Company, has accepted a position in the general engineering department of the Westinghouse Electric & Manufacturing Company at East Pittsburg, Pa.

H. T. Carlton, construction engineer for the Southern California Gas Company with headquarters in Los Angeles, is a recent San Francisco visitor. Mr. Carlton was formerly chief designer for the Rieber Laboratories in San Francisco.

Philip K. Condict, vice-president of the International Western Electric Company and recently honored by the Emperor of Japan with the Order of the Rising Sun, arrived in San Francisco from the Orient during the second week in October.

W. Brewster Hall of Pass & Seymour, New York, and George A. Gray, of the George A. Gray Company of San Francisco, under whose management the new Pass & Seymour San Francisco store was recently opened, are at present visiting Seattle.

Louis T. Wohlgroth, an engineer with the Swiss Economic Mission now making a tour of the United States, is a recent San Francisco visitor. Mr. Wohlgroth is particularly interested in the manufacture of gas for illuminating and power purposes.

Carlos E. Artigas of the Artigas Rio Frio Company, Valparaiso, among the large shipbuilders in Chile, has been in San Francisco for some time with the consulting engineer of the company, Leo Pender, looking into the purchase of ships and the equipping them with modern electric installations, including the developments of San Francisco manufacturers.

C. C. Davis, field representative of the California Electrical Cooperative Campaign for the San Francisco district, resigned Nov. 1st to become manager of the electrical department of the Turner Hardware & Implement Company of Modesto, California. Mr. Davis, though engaged in activities of the Campaign for but eight brief months, has nevertheless made his influence for good keenly felt through his district. His loss to the campaign is announced with sincere regret, but the best of good wishes are heard on all sides for his future success in his new undertaking where as a contractor-dealer he will have abundant opportunity to put into practice the gospel of cooperation he has so earnestly preached.

Jos. McElroy, 3rd, export sales manager for Pass & Seymour, Inc., with headquarters in New York City, has been making an interesting survey of how to increase friendly commercial relations with our foreign neighbors. His investigations have as a rule been used to draw forceful conclusions such as would interest men of the United States. On another page of this foreign issue of the Journal of Electricity appears a timely and helpful article by Mr. McElroy which will primarily be of interest to foreign merchants. This new angle of discussion will undoubtedly prove most effective in aiding the Journal of Electricity in its present drive to bring closer together all members of the electrical industry in Pan-Pacific countries.

C. P. Bowie, engineer in charge of the San Francisco office of the Bureau of Mines, went East to attend the dedication exercises of the Bureau of Mines Research Laboratories at Pittsburg. He plans to visit the various stations of the East before he returns.

Charles H. Pierson, advertising agent of the Southern California Edison Company, Los Angeles, California, has been appointed chairman of the Motion Picture Films Division of the Advertising and Publicity Service Bureau of the Commercial Section, N. E. L. A.

O. W. Peterson, who for the past year has been installing hydroelectric work at Unsan, Chosen (Korea), is again back in San Francisco. Mr. Peterson formerly had charge of the raising of the Spaulding Dam to its present height for the Pacific Gas & Electric Company.

H. A. Barre, electrical engineer with the Southern California Edison Company, and **S. J. Lisberger,** engineer San Francisco distribution, Pacific Gas & Electric Company, have gone East to represent Pacific Coast companies at a meeting of the National Committee on Inductive Interference and Overhead Systems with the Bureau of Standards.

T. J. McGrath, general manager of the Hawaiian Electric Company, Ltd., returned to Honolulu on the SS. Lurline, sailing October 14th, after having spent more than a month in San Francisco. **James F. Fenwick,** assistant manager of the same company, has also been in San Francisco on a business trip.

Robert Sibley, editor of the Journal of Electricity, has been appointed to membership in the Publication Committee Division of the Advertising and Publicity Service Bureau of the Commercial Section, N. E. L. A., and also in the Motion Picture Films Division.

E. N. Tandberg, electrical engineer, has returned to the United States to take up professional work, after having spent many years in China. Mr. Tandberg went to China in 1903 and had extensive engineering experience throughout the Orient. He was last with the China Electric Company, Peking and Shanghai. Recently Mr. Tandberg gave an interesting address before the Foreign Trade Club of San Francisco and presented members with his bilingual business card, which is reproduced herewith—one side being in English, the other in Chinese.

W. Brewster Hall, formerly representing Pass & Seymour, manufacturers of porcelain wiring devices, is making his farewell trip to the Northwest before turning the line over to George Gray, formerly representing Crouse-Hinds Company on the Coast. Mr. Gray will have his headquarters at San Francisco.

R. H. Ballard, vice-president of the Southern California Edison Company and president of the National Electric Light Association, has just returned from the East. As Mr. Ballard passed through San Francisco he delivered a stirring address before the Employes' Association of the Pacific Gas & Electric Company.

D. C. Henny, consulting hydraulic engineer of Portland, Ore., and recently appointed chairman of the Oregon committee working for the formation of a department of public works, was the victim of a typographical error in our last issue where he appeared as D. C. Henry. We take this opportunity to correct the error and apologize.

C. M. Bliven, who has been associated with the General Electric Company sales organization at San Francisco, Los Angeles and Seattle, for many years, recently resigned his connection with that company to become associated with the Pacific Coast sales organization of Wellman-Seaver-Morgan Company, with headquarters at San Francisco.

Peter S. Klees has announced his resignation as manager of the Franklin Incandescent Lamp Works of the Westinghouse Lamp Company, New York City, to become associated with the Pierce Fuse Corporation of Buffalo, N. Y., as vice-president and general sales manager.

R. H. Ruth has opened up a business in Rochester, N. Y., which will probably be known as the "Ruth Electric Shop." He will specialize on household electrical appliances. Mr. Ruth was for fifteen years with the Benjamin Electric Manufacturing Company, working in contact with the New York office of the concern but in complete charge of the Pittsburgh territory.

Louis Etshokin has accepted the position of Pacific Coast sales agent with the Halcum Radio Company of San Francisco. During the war Mr. Etshokin was junior lieutenant in charge of radio and signal detail at Goat Island, San Francisco. He is familiar to readers of the Journal of Electricity as author of the series of technical hints on contracting practice now appearing in the Journal.

Ellery W. Stone, formerly lieutenant in the U. S. Navy, has resigned from the service and has accepted the position of resident engineer and agent at San Francisco of Kilbourne & Clark, the well known Seattle manufacturers of radio equipment. Lieut. Stone was in charge of the government radio work in Southern California during the war and has held other positions of importance in this field previous to that time.

OBITUARY

Frank J. Somers, president and general manager of the Century Electric Company of San Jose, died recently at his home in San Jose, California. Mr. Somers was widely known throughout the West as a leader in the contractor-dealer movement. He served a year as president of the California Association of Electrical Contractors and Dealers, during which period this movement received much of its impulse throughout the West at a time when the California Electrical Cooperative Campaign was first being launched and at a time when the Pacific Coast Section, N. E. L. A., was broadening its activities so as to embrace all branches of the electrical in-

dustry. His loss will be sadly mourned by electrical men throughout the West.

Joseph H. Newlin, for more than fifteen years past superintendent of the Fresno City Water Company, and purchasing agent for the San Joaquin Light and Power Corporation, was suddenly stricken while talking over a business proposition with associates, at his desk, in his Office on October 6, passing away a week later on October 13. The death of Mr. Newlin has been a shock to the community as it had not been generally known that he was ill. Until the time of his sudden attack he had been enjoying the very best of health despite advancing years. Owing to his long service as head of the Fresno City Water Company, and to the important position he held with the San Joaquin Light & Power Corporation and its subsidiaries, Mr. Newlin became well known throughout the West and the electrical industry in the East.

Mr. Newlin and his family moved to Fresno January 1, 1904, on which day he took up his duties with the Fresno City Water Company and the San Joaquin Light & Power Corporation.

M. E. Newlin, his son, is well-known as district agent for the San Joaquin Light & Power Corporation.

Charles L. Easton, electrical superintendent of the coast properties of the San Joaquin Light & Power Corporation and the Midland Counties Public Service Corporation, and for many years a resident of Fresno, suddenly passed away on the evening of October 5th, at his home in Santa Maria. He was sick only a couple of hours, death being due to heart failure brought on by the effects of influenza of several months ago.

Mr. Easton had much to do with the development of the electric drive in the oil fields of California. His son, Frank A. Easton, is superintendent of gas properties for the San Joaquin Light & Power Corporation; his brother, Fletcher A. Easton, is assistant agent, Fresno district, of the same company.

Books and Bulletins

Elements of Radiotelegraphy

by Ellery W. Stone, Lieut. N. S. N. R. F., Member Institute Radio Engineers U. S. Naval Institute. 267 pp. Size 5¼ x 7½ inches. Published by D. Van Nostrand Company, 25 Park Place, New York, and on sale at the Technical Book Shop, San Francisco; price $2.50.

This volume, though written mainly for the instruction of radio students in the Communication Service of the Navy, is applicable to the needs of civilian radio schools and also of those interested in the subject from a non-professional standpoint. The treatment avoids the mathematical attitude as far as possible, and is such that the subject matter may be easily grasped by the layman. Though a knowledge of elementary physics and simple mathematics is desirable for a study of the text, it is not necessary. The volume comprises eleven chapters which are carefully subdivided. It is excellently arranged and well printed. The numerous illustrations —frequent line drawings, and some thirty-three plates—are a great addition.

The Trans-Pacific Magazine

Established with the idea of bettering fundamentally the relations between the countries on the Pacific by a sympathetic and non-partisan attitude, The Trans-Pacific Magazine has made its appearance in Tokyo. This financial and economic weekly, designed to be of international service, is a well planned periodical, the English section being supplemented by Japanese and Chinese sections under the editorship of natives, the whole enterprise being the work of B. W. Fleisher, editor and proprietor of the Japan Advertiser.

Observers of Far Eastern affairs will welcome The Trans-Pacific as promising to be an interesting forum for the views of Japanese, Chinese and Americans on the development of the Far East.

Foreign Trade Literature

To those studying the merchandising of electrical goods in Pan-Pacific lands, the reports on this subject issued by the Bureau of Foreign and Domestic Commerce are of unusual interest. Among the reports of special agents printed to date are those covering the electrical trade in New Zealand, Australia, Ecuador and Peru, Bolivia and Chile. Copies of the pamphlets can be secured at a nominal price from the San Francisco or Seattle office of the Bureau.

Miscellaneous

A recent catalog from the Sprague Electric Works of the General Electric Company deals with Safety Panel Boards and Cabinets.

The Ohio Brass Company of Mansfield, Ohio, sends out a folder on "How to Make a Good Trolley Splice."

"Typical Graphic Records," published by the Esterline Company of Indianapolis, reproduces a number of curves showing industrial data secured with the company's graphic recording instruments.

The "Emerson Monthly," published by the Emerson Electric Manufacturing Company, St. Louis, devotes the greater part of its September issue to small motors.

The September issue of the G-E Advertiser is a building number featuring home electrical appliances.

A well-illustrated attractive little booklet appears as the bulletin of the Philadelphia Electric Company—"published every little while for the information and in the interest of customers." The latest issue contains among other things data on washing and ironing machine efficiency and savings, and on the labor-saving capacity of the dishwashing machine and the vacuum cleaner.

Allis-Chalmers Bulletins

Three recent well illustrated bulletins come from the Allis-Chalmers Manufacturing Company, Milwaukee, Wis. The first describes the machinery and appliances which make up the equipment of a rock crushing plant, the second deals with a bag filter type of dust collector recently designed and patented by the company, the third contains an account of the McDougall Roasting Furnace built by the company and installed at various important smelting plants.

New House Organ

Under the title of "The Grid" appears the first number (October, 1919) of an interesting little house organ, to be published quarterly by the Edison Storage Battery Company, Orange, N. J. It contains good material and is well edited. We wish it luck.

Good Lighting

A neat catalogue has been issued by Harvey Hubbell, Inc., of Bridgeport, Connecticut, describing and illustrating the line of Hubbell Reflectors for industrial plant lighting.

The National X-Ray Reflector Company sends out an artistic folder under the title "Eye Comfort," illustrating the use of reflectors in all kinds of home and commercial lighting.

Meeting Notices for Electrical Men

(The N. E. L. A. Convention for 1920 has been definitely announced for May 18th to 21st at Hotel Huntington, Pasadena, Cal. Two other national conventions, the Electrical Supply Jobbers' Association and the Foreign Trade Congress, are scheduled for the Pacific Coast during the coming year. Of immediate interest are several local meetings of importance which have taken place during the past two weeks.—The Editor.)

Electrical Contractors and Dealers' Association of San Francisco

At the meeting of the San Francisco electrical contractors and dealers, October 10th, unanimous decision was made to join in a body the state and national organizations of contractors and dealers. This movement for 100% membership came after an address urging support of the larger bodies, by J. W. Redpath, secretary of the state association. A summary of the provisions of the proposed new municipal ordinances governing electrical installations and contracting was given, and their adoption by the Board of Supervisors recommended.

Among the guests of the association at this meeting was T. J. McGrath, general manager of the Hawaiian Electric Co., Ltd.

The session of October 17th was taken up with discussion of practical problems affecting the industry. Vice-President W. B. Kohlwey presided.

The meeting of October 24th was addressed by Arthur Rowe, who made an eloquent appeal for unselfish cooperation among electrical men. Mr. Rowe gave an account of the funeral ceremonies of Frank J. Somers of San Jose, and told of the movement toward organization among electrical contractors and dealers in that city. President Clyde L. Chamblin outlined the conditions in the industry in southern California, whence he had just returned.

During the month the Retail Section of the association held several successful evening meetings in the States Cafe, under the leadership of W. B. Kohlwey, chairman. On October 14th the section was addressed by C. C. Davis of the California Electrical Cooperative Campaign, who gave an instructive talk on "Stock and Turnover." Another meeting and dinner was held on October 21st, and J. W. Redpath, secretary of the California Association of Contractors and Dealers, spoke on Advertising. A general discussion followed, the consensus of opinion favoring the taking of a page each week in some San Francisco daily newspaper for the purpose of promoting the electrical trade, especially during the Christmas holidays.

San Francisco Electrical Development League

The meeting of the San Francisco Electrical Development League, October 13th, was featured as "Past Presidents' Day." Former chief executives of the league graced the head table with their presence, and several of them addressed the gathering. Friendly counsel, based on past experience, was given by Col. Carter, R. E. Fisher, Garnett Young and T. E. Bibbins.

Resolutions of condolence were sent to the families of Frank J. Somers of the Century Electric Company, San Jose, and Joseph H. Newlin, of the San Joaquin Light & Power Corporation, both of whom passed away on the morning of the meeting.

M. M. O'Shaughnessy, city engineer of San Francisco, addressed a large meeting of the league on October 20th, his topic being "The Hetch Hetchy Project." Mr. O'Shaughnessy gave an interesting account of the history of the project, and described the work at present being done, with particular reference to the electrical development at Power Houses 1 and 2. At the latter, 66,000 horsepower will be developed. He told also of the construction work about to commence on the Hetch Hetchy Dam, the contract for which has been awarded to the Utah Construction Company. Mr. O'Shaughnessy urged cooperation with the municipality in carrying the project to speedy completion.

Electrical Mass Meeting

A highly interesting meeting under the auspices of the Pacific Service Employes' Association was held in the Scottish Rite Auditorium, San Francisco, on Friday evening, October 24th. After musical numbers contributed by Pacific Service members, John H. Britton, vice-president and general manager of the Pacific Gas & Electric Company, A. E. Wishon, assistant general manager of the San Joaquin Light & Power Corporation, and R. H. Ballard, president of the National Electric Light Association, took the platform. Mr. Wishon, the first speaker, called attention to the important part which the West is now playing in electrical activities, and to the Electric Light Association under Mr. Ballard's leadership, and the new stimulus given by the Geographic Section idea.

Mr. Britton in introducing Mr. Ballard warmly praised his ability to communicate his own enthusiasm to others, as demonstrated on his recent Eastern trip, on which Mr. Britton accompanied him. Mr. Britton expressed his confidence that the Pacific Coast Section N. E. L. A. was standing solidly behind Mr. Ballard, and added a few remarks on the responsibility of the individual members of the public utility in the formation of public opinion.

Mr. Ballard, after a few premliminary remarks, took up the subject of the N. E. L. A. Convention, to be held in Southern California in the spring of next year. He stated that this convention would differ from previous ones in one very important respect, namely, that the meetings would all be joint meetings and the "three-ring circus" plan would be dispensed with. By this means they hoped to secure greater

BUILDERS OF THE WEST — LXIV

JOHN BARRETT

Permanent friendship among the world's peoples is an ideal which many have aspired to serve. To few men have come such opportunities for that splendid service as to one who for twelve years has helped maintain the peace and amity of half the world, as Director General of the Pan-American Union. Commencing his career as a journalist in San Francisco, Portland and other cities of the Pacific Coast, he entered the diplomatic field as minister to Siam. Several years he devoted to intimate study of Pan-Pacific problems; and in his later duties as a leader among all the American republics, he was never forgetful of the interests of the vast Pacific area. To John Barrett, therefore, this issue of the Journal of Electricity is affectionately dedicated, in appreciation of his consistent aid to the commerce and industry of the West, and of the lands beyond the West.

THE SCENE OF THE 1920 N. E. L. A. CONVENTION
The beautiful Hotel Huntington, Pasadena, which will be entirely given up to the electrical industry of the nation from May 18-21, 1920.

cooperation between different branches of the industry, and a better mutual understanding.

The evening concluded with a one-act play presented by the Pacific Service Players' Club and was followed by dancing.

San Jose Association of Electrical Contractors and Dealers

The San Jose Association of Electrical Contractors and Dealers was organized on Wednesday, October 22nd, with 100% membership and 100% enthusiasm. The meeting was addressed by Clyde L. Chamblin, president of the San Francisco local and incoming president of the state association. Arthur Rowe of San Francisco also assisted in the organization, which was along the same lines as those of the San Francisco association. Charles Fraser was elected president.

Electrical Cooperative League

The feature of the October 22nd meeting of the Electrical Cooperative League of Los Angeles was an address by A. Emory Wishon, assistant general manager of the San Joaquin Light & Power Corporation, on "Self-Interest in Electrical Development."

Ralph B. Clapp presided at the meeting, and entertainment was provided by the Pension Octette of the Southern California Edison Company.

A. I. E. E., Seattle Section

At a meeting of the Seattle Section of the American Institute of Electrical Engineers held on October 21st and address was given by C. Sweet on "Motor Driven Auxiliaries on Motor Ships." The paper described novel adaptations developed under Mr. Sweet's direction, of electric motors to the driving of hoists, winches, etc., replacing the usual steam equipment on motor-propelled ships.

Portland Section, N. E. L. A.

A joint meeting of the Portland Section N. E. L. A. and the American Institute of Electrical Engineers will be held in Portland on November 18th. Dr. Jewett, chief engineer of the Western Electric Company, will address the meeting on "The Development of Communication of Intelligence During the War."

THE N. E. L. A. CONVENTION

Pasadena, preeminently beautiful among the cities of Southern California, has been selected as the place of holding the next convention of the National Electric Light Association. It will convene at Hotel Huntington on May 18th, 1920, and continue in session including May 21st. The selection of the convention city was made by the executive committee of the national organization at headquarters, 29 West Thirty-ninth Street, New York City, and was announced by President R. H. Ballard on the evening of October 7th. Data thus far collected by the executive committee indicates that at least two thousand delegates will attend the convention, going to California by special trains.

Los Angeles, Santa Barbara, Riverside, and San Diego each sent invitations to the executive committee requesting the honor of holding the convention. The invitations from Pasadena took the form of telegrams to the executive committee from all of its civic bodies.

The choice fell to Pasadena, because of its superior hotel accommodations; the fact that it is only nine miles from Los Angeles, the metropolis of the Southwest; and because the Hotel Huntington, beautifully situated in the San Gabriel Valley, can provide quiet and restful hospitality for those who attend the convention.

The executive committee is in receipt of telegraphic advices from Pasadena that the Maryland and Green, both large tourist hotels, will reserve sufficient rooms to accomodate the overflow of visitors who cannot be cared for at Hotel Huntington.

Pasadena, known as the crown city of the San Gabriel Valley, is world-famed as a summer and winter tourist resort, and the home of many millionaires, authors, artists, and celebrated people. It lies almost directly beneath Mt. Wilson, and the mountains of the Sierra Madre range form a crescent to the north. In every direction the wonderful automobile roads for which Southern California is renowned lead out through labyrinths of orange groves, and down to the Pacific and a dozen seaside resorts.

President Ballard has received wire advices from Los Angeles, California, his home city, that the civic bodies of

Pasadena and the several large electric corporations which operate in the Southwest will cooperate with the committees of the organization in providing entertainment to the tourists and their families, which will make their visit to Southern California an event of unprecedented pleasure.

ELECTRICAL SUPPLY JOBBERS' ASSOCIATION

The date of the Pacific Coast meeting of the Electrical Supply Jobbers' Association at Del Monte has been changed from Nov. 13, 14 and 15 to December 4, 5 and 6. The change has been made on account of the general meeting to be held on Nov. 18, 19 and 20 at Cleveland, at which it is felt there should be a large Pacific Coast delegation present to urge the desirability of holding the Jobbers' convention next May in California. It is hoped that the change in the dates of the Pacific Coast meeting will enable a large Western delegation to go to Cleveland.

INSTITUTE OF RADIO ENGINEERS

BY D. I. CONE

A paper by E. T. W. Alexanderson on "Transatlantic Radio Communication" was presented by Prof. Harris J. Ryan to the San Francisco section of the Institute of Radio Engineers at its meeting of Oct. 17, held at the Engineers' Club. There was a large attendance and much discussion. Officers for the section were elected, as follows: Chairman, W. W. Hanscom (incumbent); secretary-treasurer, Major J. F. Dillon; member of executive committee, Prof. A. Press.

The paper presented, which appears in the October Proceedings, A. I. E. E., and the November Proceedings, I. R. E., describes the present situation relative to high-power radio communication, and indicates ways of enormously expanding the message-carrying capacity, by (1) greater speed of sending; (2) increased selectivity, permitting less differences of wave-length between stations; (3) directional transmission. The Alexanderson high-frequency generator, its speed-control, the magnetic amplifier, and the new multiple antenna, are described in considerable detail.

Prof. Press described theoretical studies of a very efficient antenna, to which the multiple antenna approximates. A general discussion of directional transmission was concerned largely with observations of airplane antenna performance.

The November meeting will have for its subject a paper on "Vacuum Tubes," by O. B. Moorhead.

FOREIGN TRADE CONGRESS

The seventh annual Foreign Trade Congress is to be held in San Francisco from May 12th to May 15th, 1920. "Problems of the Pacific" is the special theme of the convention, but there will be discussions on practically every phase of the overseas commerce of the United States. The gathering will be large and representative, including leading American business men resident not only in the United States but in foreign lands as well. Special steamships have been chartered to bring delegates from the Far East, and from the west coast of Africa—one liner starting from Calcutta and another from Valparaiso. A special ship will also go from New York to San Francisco by way of the Panama Canal, and several special trains bearing delegates will cross the continent by different routes.

All these preparations to facilitate attendance, and the widespread interest manifested in the Congress, assure a successful meeting of such magnitude as the last Foreign Trade Convention, at Chicago. Attendance is by invitation only, but any reliable American business man can readily procure an invitation. The Congress is under the auspices of the National Foreign Trade Council, which includes many of the most influential commercial and industrial leaders in the country. James A. Farrell, president of the United States Steel Corporation, is president of the council, and the treasurer is R. H. Patchin, manager of the Foreign Trade department, W. R. Grace & Co. O. K. Davis, New York City, serves as secretary of the Foreign Trade Council.

While San Francisco will be host of the convention, all the Pacific Coast cities are counted on to help entertain the delegates in characteristic fashion; and there will be an excursion to Honolulu, Hawaiian Islands. Without question, the Pan-Pacific area will gain much permanent benefit through the holding of the Foreign Trade Convention in San Francisco, 1920.

HAPPENINGS IN THE INDUSTRY

FREE INSURANCE FOR EMPLOYES

The San Joaquin Light & Power Corporation on October 15th put into effect an insurance plan for the benefit of its employes. Every person who has been in the employ of the company, or any of its subsidiary companies, for more than ninety days of continuous service, will automatcially share in the benefits. The subsidiary companies include the Fresno City Water Company, the Midland Counties Public Service Corporation, Bakersfield and Kern Electric Railway, and several gas and water companies in the smaller towns throughout the territory. The amount of the insurance to be placed to the credit of the employe is governed by length of his or her service with the company. The minimum amount is $1000 and the maximum $1500, graduated as follows:

During first year service, $1,000 insurance.
During second year service, $1,100 insurance.
During third year service, $1,200 insurance.
During fourth year service, $1,300 insurance.
During fifth year service, $1,400 insurance.
During sixth year service and over, $1,500 insurance.

The insurance will be carried by the company without any cost or obligation whatsoever upon the part of the employe. All that he or she will be required to do is the signing of a formal application for insurance, naming beneficiary in the case of death. All employes in all departments will be given credit for the length of service they have given the company to date.

A. G. Wishon, general manager of the San Joaquin Light & Power Corporation and subsidiary companies, in announcing the insurance plan, made public the decision of the directors to grant two of the highest class policies to the beneficiaries of two old-time employes, who have recently died, out of regard for their long terms of faithful and loyal service. These employes are Charles L. Easton, former electrical superintendent of the Midland Counties Public Service Corporation, who has been in the employ of the company for twenty-one years and whose death occurred in Santa Maria Sunday, October 5; and J. H. Newlin, for fifteen years past superintendent of the Fresno City Water Company and purchasing agent of the San Joaquin Light & Power Corporation and subsidiaries. Mr. Newlin died at his home in Fresno October 13.

As an idea of the wide effect the insurance will have in the ranks of the Power Company employes, it is only necessary to state that at the present time there are more than one thousand names on the pay rolls of persons—men and women—entitled to the benefit. Of this number 112 will automatically go into the highest class, having been in the employ of the company for six years or more.

NEW EXPRESS PACKING RULES

Preparations are being made to put the new express packing rules into effect on December 10th, the date authorized by the United States Railroad Administration, which recently approved the new requirements.

The new rules were put into effect to induce shippers to turn their business over to the carrier so that it can, with reasonable care on the part of the express company, be handled properly. The rules will not permit the use of paper wrapping for packages over 25 pounds, nor of ordinary paper boxes, wrapped or unwrapped, when the weight of the contents is over that limit. For shipments over 25 pounds, wooden containers, or fibreboard, pulpboard, or corrugated strawboard containers of specified test strengths, are required.

This standardization of express rules will place the express service on the same basis as freight, so far as the character of the cartons used is concerned. Express traffic supervisors are of the opinion that the stronger containers required will very perceptibly help to improve the express service and to protect the miscellaneous commodities shipped by express from damage or interference enroute. It is calculated that the time remaining before December 10th will be sufficient to enable express shippers to adjust themselves to the new packing requirements.

COOPERATIVE ADVERTISING

Enclosed with a copy of the newspaper advertisements for October, prepared by the California Electrical Cooperative Campaign for use by the central stations, is the following message to the retailer:

The sole purpose of these advertisements is to interest the public in the appliances you sell. These advertisements are business builders and of vital importance to your success.

The Advisory Committee recommends that you call on the central station manager in your city and let him know that you are interested in these advertisements. He will be more inclined to use them if he knows that the dealer interested is appreciative.

You should tie-in with these advertisements if you expect to secure the benefits of them and direct this building force to your own business. That is, you should run an advertisement of your own, calling attention to the place where electrical appliances can be purchased (your store), and state definitely the electrical appliances the public can purchase from you (your stock).

Your jobber and manufacturer have advertisements that will do this for you. Call on them to furnish you with this service that is your due.

STREET RAILWAY TAXES

Thirty days delay in consummating the purchase of the street railway lines by the city of Seattle will cost the taxpayers the sum of $300,000, unless the supreme court of the state shall rule that the taxes can be remitted, as the car lines are now the property of the city. Property for assessment purposes is valued as to its ownership at noon March 1 of each year. The car line transfer was made on April 1. The total taxes levied this year against the street car lines, formerly the property of the Puget Sound Traction Light & Power Company, will be slightly more than $400,000. The additional $100,000 will be paid by the electric company according to an agreement signed with city officials when the sale was made, providing for pro-rating the taxes if any were levied.

RED CROSS CHRISTMAS SEALS

The National Tuberculosis Association will conduct its annual sale of Red Cross Christmas Seals from December 1st to December 10th. The proceeds of the sale go to combat the spread of tuberculosis.

COMPANY PLANS CAPITAL INCREASE

At a special meeting of the stockholders of the Hurley Machine Company, held at the company's offices in Chicago, October 2nd, it was voted to change the capitalization in so far as the common stock was concerned from 15,000 shares of a par value of $100 to 200,000 shares of no par value. This new stock will be exchanged on the basis of seven shares for one of the old common stock. An increase in the membership of the board of directors from five to nine was also authorized.

The old common stock paid 8% per annum in dividends and the offering of new stock will be made to stockholders of record October 15th. The plan to change the capitalization has been responsible for an advance in the common stock on the local curb from a little over par to 208 in the past few weeks. The rate of earning of the new stock has not been decided upon.

The preferred stock was not changed and remains the same, namely, 5000 shares of a par value of $100. This stock brings dividends at the rate of 7% per annum. It will eventually be retired through a cumulative sinking fund of 3% of the outstanding issue for each year beginning next January and also 15% of the net earning applicable to the common stock beginning January 1, 1918.

An offering to the common stockholders of record October 15th, of 10,000 shares of the new common stock at $35 per share was also authorized. The proceeds from the share of this stock is to be used in the extension of the company's plant facilities. The demand for the company's products, which includes the well-known Thor line of electric washers, ironing machines and vacuum cleaners, has grown rapidly in the past few years and has necessitated the building of large additions to its present plant.

The new board of directors will consist of the following:

Edward N. Hurley, chairman.
Neil C. Hurley, president of the Hurley Machine Co.
Samuel Felton, president of the Chicago Great Western Railway.
John Burnham, John Burnham & Co.
Edward F. Carey, president of the Haskell Barker Car Co.
Joseph E. Otis, vice-president of the Central Trust Co. of Illinois.
Silas Strawn, Winston, Strawn & Shaw.
Alva J. Fisher, vice-president of Hurley Machine Co.
Edward N. Hurley, Jr., president of the Hurley Supply Co.

JAPANESE TURBINE INSTALLATION

Two 25,000-kw. steam-driven turbine units of Westinghouse make, which, when installed, will complete the largest steam-driven electrical installation in the Far East, are now being erected at Osaka, Japan, for the Osaka Electric Light Company.

Located in an extensive industrial district, this company furnishes light and power to street railways, steel works, ship builders, copper refining plants, paper mills, electrochemical installations and other industries.

It is noteworthy that in 1908 the Osaka Company installed three steam turbine units of 3,000 kw. each. In 1910 two more units of like capacity were added, and in 1911 two 5,000-kw. units. The 25,000-kw. units now being installed will bring the capacity of this plant up to 100,000 hp. All of the above units are of Westinghouse manufacture.

NEW HYDROELECTRIC DEVELOPMENTS IN JAPAN

The shortage of motive power in large cities in Japan has called forth numerous water power projects. The present situation resembles closely that which existed at the close of the Russo-Japanese war except that in the latter case the main stress was laid upon electric lighting while the recent tendency is toward electric power. The following are some recent additions to the list of projects:

The Kanto Hydroelectric Company is being planned, to develop a power of 168,000 hp., by harnessing the River Tone and its branches. The total capital needed is estimated at $8,500,000. The power developed will be transmitted to and sold in Tokyo.

The Nippon Water Power Company is being organized with a capital stock of $22,000,000, by the Osaka Electric Company, the Kyoto Electric Light Company and the Hokuriku Electro-Metallurgy Company interests. The purpose is to develop power for transmission to Osaka, Kyoto and vicinity.

STANDARDIZATION AS AN AID TO WORLD PEACE

At the dinner given in honor of Mr. Charles LeMaistre, secretary of the British Engineering Standards Association, by the American Engineering Standards Committee, the guest

of the evening expressed the opinion that one of the strongest ties which can bind two or more nations together is engineering and industrial standardization.

Mr. LeMaistre said, in part:

"Standardization means efficient production. It can only be effective when overlapping is avoided. Overlapping can only be obviated by the operation of some central organization, which we have provided in Great Britain with wonderful effect. We find now that overlapping of effort is becoming less and less each year and the British Engineering Standards Association is becoming more and more recognized as the central authority for drawing up standards for the engineering and allied industries.

"My Association feels that, at the present important stage of the development of the work and of the closer relationship with the United States, if only we could get coordination of standardization on both sides of the water, one central authority on each side, it would not only help our industries enormously, but we could work hand in hand on these technical problems which involve this complicated human factor. And in doing this big work we would surely be no mean influence in promoting the peace of the world."

SHIPS FOR THE PACIFIC

A tentative program of allocation of ships for Pacific trade has been announced as follows:

15 ships (weekly sailings) San Francisco to Japan, China and Philippines.
2 ships San Francisco to Vladivostok, Manchuria, China and Japan.
2 ships San Francisco to India and Dutch East Indies.
2 ships San Francisco to Tahiti, Tonga, Apia and Honolulu.
4 ships Los Angeles to Japan, China and Philippines (weekly sailings).
4 ships (weekly sailings) Portland to Japan, China and Philippines.
14 ships Seattle to Siberia, Manchuria, Japan, China and Philippines.
10 ships from general Pacific Coast ports to Europe.
4 ships from general Pacific Coast ports to Australia and New Zealand.
3 ships from general Pacific Coast ports to West Coast of Mexico, Central America and South America.
3 ships from general Pacific Coast ports to West Indies, Venezuela and Colombia.

In addition to the foregoing allocation to regular trade routes there will be fifteen ships which would be known as seasonable or tramp ships. They will be placed in service from Pacific Coast ports to China, India and Australia and will call at any Coast ports if the amount of trade will insure a sufficient cargo.

COURSES IN FOREIGN TRADE

The College of Overseas Commerce, Flood Building, San Francisco, has recently announced a course of training for overseas commerce, beginning on October 20th last and continuing for two months. The course is under the direction of A. E. Paulson, S. N. Smiley, Geo. W. Fishback and John J. Seid, and will cover the following subjects: Processes and Documents in Export Transactions; Commerce with the Orient, and Marine Insurance; The Operations of Foreign Exchange; Commercial Relations with Latin America.

VISIT OF SWISS MISSION TO ELECTRICAL PLANTS

The Westinghouse plants at East Pittsburgh and Wilmerding were recently honored by a visit from the Swiss Mission for economic studies in North America.

This mission is visiting various cities in the United States and Canada, for the purpose of studying American methods and practices.

Following the reception at Wilmerding a trip was taken through the Airbrake Works, where the various processes involved in the manufacture of the airbrake were explained in detail to the visitors, who expressed much interest in the manufacturing methods pursued by the company. Later the party were shown through the electric and machine works constituting the East Pittsburgh plant.

INDUSTRIAL GROWTH IN AUSTRALIA

Australian industries have expanded during the last three years, judging from the amounts of new capital issues authorized in that commonwealth. The issues total $368,400,000, divided as follows:

Manufactures and production	$172,700,000
Trade and finance	87,000,000
Mining	48,900,000
Public utilities	22,100,000
Other capital issues	36,700,000

Of these authorizations $194,800,000 were granted to new companies, and $173,600,000 to existing companies.

JAPANESE TRADE WITH NEW ZEALAND

Japan's imports into New Zealand are increasing rapidly, and they consist almost entirely of manufactured goods. During the war period large quantities of Japanese goods flooded this market. The increased trade between Japan and New Zealand for the last six years is shown by the following table:

Year	Exports to Japan	Imports from Japan	Year	Exports to Japan	Imports from Japan
1913	$ 14,166	$ 735,357	1916	$535,533	$2,739,712
1914	289,594	912,472	1917	21,353	3,060,162
1915	668,968	1,480,982	1918	26,351	5,912,140

It will be noticed that the exports to Japan have fallen off greatly during the past two years, owing to the fact that wool, the principal export to that country, was commandeered by the British Government.

The chief lines of export to New Zealand for 1917 included electrical insulated cable and wire, the value of the exported material amounting to $48,998.

RAILWAY ELECTRIFICATION IN NORWAY

The first definite step to be taken in the plan for the electrification of the entire railway system of Norway is the acceptance of bids by the Norwegian Government for the electrification of the railway from Christiana to Diammen. The bids include 18 normal gage locomotives, to be built in Christiana. Power is to be obtained from the Hakavik power station, which can produce about 25,000 horsepower.

WATER POWER IN CANADA

A comprehensive report recently published by the Water Power Committee of the Joint Board of Scientific Societies, in London, England, shows that Canada possesses more than one-quarter of the entire water power capacity of the whole British Empire. It is pointed out that for the Empire to recover with any degree of rapidity from financial burdens resulting from the war, it will be necessary to develop its latent resources to a much greater degree than ever before. For this, an ample supply of cheap energy must be made available. Because of the cheap water power in Canada, it is expected that many of the large British manufacturers will move their plants to that country. Many new enterprises, backed by British capital, are also looked for.

DEVELOPMENT ON WINNIPEG RIVER

A huge power plant is being constructed at Du Bonnet Falls, on the Winnipeg River, 75 miles north of the city of Winnipeg. This will be the greatest link in the chain of power sites on the river, which is expected to supply eventually a total horsepower in excess of half a million. The entire course of the Winnipeg River lies within 100 miles of the metropolis of Manitoba.

The huge Du Bonnet Falls project is being developed by the Winnipeg River Power Company, closely allied with the McKenzie-Mann interests and the Winnipeg Electric Railway Company. It will have an ultimate capacity of about 168,000 hp., and is being constructed in six units of 28,000 hp. each. When completed, the cost of the whole project will be between $6,000,000 and $7,000,000. Engineers declare that the capacity of the new plant will exceed the combined power output of the City of Winnipeg's plant at Point du Bois and that of the Railway Company at Pinewa Channel.

A special extra section devoted to news of the Pan-Pacific field will be found under "New Electrical Developments" in this issue.

ELECTRICITY IN IDAHO

The Idaho Public Utilities Commission, October 11, rendered a decision in the somewhat celebrated electric heating case, wherein it was said not to be feasible to heat by electricity in Idaho, and that it would be unwise to hold out to residents that this could be done.

Every hydro-electric power company in the state was cited to appear and give evidence in this case nearly a year ago. A month was occupied in taking the evidence. Since then the commission has had it under consideration.

The claim was made that heating homes and office buildings in Idaho by electricity was practical. The Commission holds it is not. The decision is the first of its kind rendered in the United States.

TRADE NOTES

New Business —

Under the firm name of Regalia and Behan, Fred Regalia and Richard F. Behan have opened a large new automobile repair shop at 1774 Mission Street, San Francisco.

Firms Merged —

The Electric Agencies Company, Inc., of California, with offices in San Francisco, Los Angeles and Seattle, has been absorbed by the Allied Industries, Inc., of California. The new arrangement was made for the purpose of broadening the scope of old company's activities, to provide better facilities for handling business and give for the company's and the client's mutual benefit the best possible representation of the manufacturer.

B. A. Wagner, of the Electric Agencies Company, W. S. Greenfield, former manager of the H. W. Johns-Manville Company of California, M. H. Klinger, F. G. Van Booskirk and C. D. Slaughter, formerly with the same company, will be the directing heads of the new firm. R. Wolfsberg continues in charge at 340 Azusa Street, Los Angeles, and R. C. Shipman at 1252 First Avenue South, Seattle, Wash.

Two New Offices Opened —

The Mechanical Appliance Company, makers of Watson Electric Motors, with factory and main offices at Milwaukee, Wis., have recently opened up new offices in Buffalo and St. Louis.

W. C. Winterroth, formerly connected with their Chicago office, will be located at 318 Prudential Building, Buffalo, as district sales manager for Western New York.

The St. Louis office will be in charge of L. F. Mahler, who has recently been appointed district sales agent for St. Louis and adjacent territory. His office is located at 1039 Syndicate Trust Bldg., St. Louis.

Change in Company —

F. C. Green has retired from the firm of E. L. Knight & Company, Portland, Ore., and has sold his interest in the business and good-will to E. L. Knight who will continue the same at the old location, 449 Washington Street, under the former firm name. Mr. Knight has assumed all the liabilities of the old firm.

THE PELTON WATER WHEEL

A Letter to the Editor

Editor Journal of Electricity:

In your issue of Sept. 15th Mr. Chas. H. Tallant discusses the origin of the Pelton water wheel and says (p. 265) that it was invented by Lester A. Pelton "in the late 'seventies." A little farther on he says, "Pelton made a trip to the State University at Berkeley, where he arranged with Professor Hesse, professor of mechanical engineering, to design and build an impulse wheel in accordance with his own discoveries. * * *"

I do not desire to question the above statements, but as an old U. C. man, and in justice to the memory of the late Professor Hesse, I would like to have it known that he designed a divided bucket wheel about ten years before the time mentioned by Mr. Tallant. In proof of this statement I wish to quote from a pamphlet by Mr. Pelton himself on the "Origin of the Pelton Water Wheel, with a statement by F. G. Hesse, Professor of Mechanical Engineering, University of California" (J. W. McCombs, Printer, 426 Ninth St., Oakland, Cal., May, 1887).

Quoting parts of Prof. Hesse's letter: "At some time between 1865 and 1868, Joseph Moore, then superintendent of the Vulcan Iron Works, San Francisco, asked my opinion of the best water wheel. * * * I furnished drawings for such a bucket (diagram showed the now well-known divided bucket). * * * I never contemplated taking out a patent * * * Since meeting you I believe your statement that you had no knowledge of what I had done in this field. Yours very truly, F. G. Hesse."

Very respectfully,

A. L. JORDAN.

"LUMEN" AND "CANDLE POWER"

A Letter to the Editor

I have followed with considerable interest the series of articles entitled "Practical Lessons in Electricity" by H. H. Bliss, which forms a basis for correspondence courses in elementary electricity offered by the Extension Divisions of the Universities of California and Oregon. In reading the last lesson in the Journal of Electricity for October 1, 1919, I note that the author in discussing candle power refers to spherical candle power and from that develops the total quantity of light given out by a lamp and refers to this quantity as units, without specifying any names for the units.

The Illuminating Engineering Society has for some time been endeavoring to have lamps rated on a more rational basis than that of horizontal candle power. This unit is not a true measure of the quantity of light obtained from a lamp because of the fact that the light is not emitted at the same intensity in all directions. The use of the term "mean spherical candle power" is somewhat of an improvement but this is only a hypothetical unit. There is, however, a unit which is used to indicate the total output or flux of light from any light source. This unit is called the "lumen." Lamps are now being rated in lumens instead of candle power and eventually the term "candle power" is certain to disappear and the term "lumen" will be used exclusively for the comparison of the illuminating value of various light sources, as well as for the determination of illumination problems. The sooner the public is educated to use the term "lumen" instead of "candle power," the sooner will this condition be brought about. In the lesson referred to, the use of this unit in the determination of illumination is shown and it would seem that to give a definite name to the numerical value would make the meaning simpler to the beginner as well as be of great assistance educationally by familiarizing the beginner with the use of the correct term.

This is an educational opportunity too great to be overlooked and I believe should be brought to the attention of the editor of these lessons, as undoubtedly it was an oversight on his part in not including the name of the unit instead of leaving the values with no particular identification mark. In other words, if he would simply change the term "unit" in the 2nd, 3rd and 4th paragraphs from the end of his article on page 315 to "lumen," he would be accomplishing much more than he is at the present time and would make his explanation fully as clear. The term "lumen" will be just as easily understood in a short time as the term "candle power" and is certainly a great deal more rational.

Very truly yours,

F. H. MURPHY,
Illuminating Engineer,
Portland Railway Light & Power Company.

Display of dealers' helps and window trim material which formed the background of a lamp selling demonstration at the recent Edison Lamp Agents' Conference

LAMP DEALERS' CONFERENCE

The problem of how best to sell lamps was considered from all angles at the recent conference of Edison Lamp Agents, held on October 10th at the Palace Hotel, San Francisco. The meeting was in charge of F. D. Fagan, district sales manager of the Edison Lamp Works at Oakland, Cal., and was attended by about seventy-five dealers and representatives from the General Electric Company and the Pacific States Electric Company.

E. O. Shreve, San Francisco manager of the General Electric Company, made a brief introductory address and then turned the meeting over to Mr. Fagan, who pointed out the importance of lamp sales as a forerunner for other business and discussed many of the practical problems of keeping an adequate stock which shall still be live throughout.

D. E. Harris, vice-president of the Pacific States Electric Company, pointed out that with the new estimate of customers' buying ability, dealers may count on a possibility of $500 to every home, or an average of $100 per person. He further emphasized the importance of lamp merchandising as the one feature which ties a business together. The customer who has received satisfactory service from the lamps which have been furnished by the dealer will be open-minded on the subject of other electrical appliances, lamps and washing machines, for instance, being suggested as a good combination on which to specialize.

Reports were made by several dealers on methods which they had found effective in lamp merchandising. W. S. Hanbridge of the Hanbridge Electric Shop, San Francisco, emphasized the value of utilizing the dealers' helps sent out by the national manufacturer, particularly by slipping folders into all lamp packages before they are handed to the customer. Louis Levy of the Levy Electric Company reported briefly on the lamp campaign which he has been carrying on with the help of the school children of his neighborhood. A similar plan had been tried by one of the other companies and had in both instances proved most satisfactory, much interest being shown by parents and friends in the store for which their children had been working. M. L. Scobey of the Home Electrical, San Francisco, told of the excellent business which he had built up about lamp contracts with apartment houses and business establishments. He also pointed out the possibilities in national advertising of which the dealer is not yet taking full advantage. Several other dealers reported on their successes in lamp selling as a factor in general store merchandising.

L. E. Voyer, illuminating engineer with the sales organization of the Edison Lamp Works, reported on the new lighting code for California. The code is now in process of being printed and will be put into effect some time in November.

A pleasant luncheon was served in the interval between the morning and afternoon sessions, during which T. E. Bibbins, president of the Pacific States Electric Company, spoke on the importance of loyalty in business relationships.

Several of the visitors at the conference were asked to speak a few words. George R. Purvis of the Hurley Machine Company told of the installation of the new Thor Shop in San Francisco. L. H. Newbert, in charge of the commercial department of the Pacific Gas & Electric Company, spoke on the California Electrical Cooperative Campaign and its plans for the immediate future. Robert Sibley, editor of the Journal of Electricity, pointed out the importance of the coming year to the electrical industry of the West and urged a united effort to reap its full benefits.

R. M. Alvord, local manager of the Supply Department of the General Electric Company, demonstrated the use of the new poster box covers for small supply material on the dealer's counter as well as in his window and showed three different types of window displays in which mazda lamps were tied in with other appliances or apparatus in the appeal to the public. He also pointed out the need for better merchandising in order that the public may eventually benefit from the reduced cost of distribution and not become discontented because the improvements so widely heralded were not passed on to them.

M. T. Dolman, manager of the sales promotion bureau of the Pacific States Electric Company, supplemented by D. E. Harris, explained the function of his company in tying-in with the magazine advertising of the Edison Lamp Works, both in assisting the dealer with his advertising problem and in the following up of prospects.

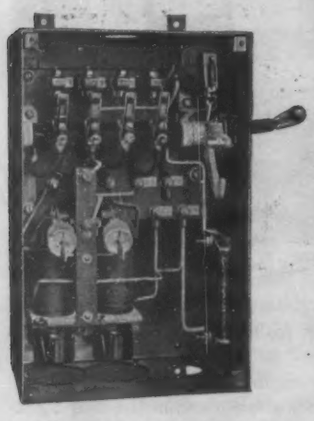
The afternoon's program was concluded by a most entertaining and instructive demonstration of how to sell lamps and how not to do it, staged by F. D. Fagan and H. H. Daley. Most valuable suggestions were brought out in the discussion which followed, both in regard to the more effective use of national advertising in the store and the emphasis upon the quality of the goods sold by the electrical dealer, which is his strongest argument for continued dealing with his store.

LATEST IN EVERYTHING ELECTRICAL

(For the motor which cannot be connected directly to the line without resulting in a dangerously large starting current, a special starter has been designed. Another type of squirrel cage motor starter recently put on the market, and a convenient combination electrical set for traveling are among the new apparatus here reported.—The Editor.)

POLYPHASE MOTOR STARTERS

The important features of two new squirrel cage motor starters now on the market include a time limit overload relay and a starting resistor for motor protection, and safety operating design. The starters, known as Bulletins 9117 and 9118, are manufactured by the Cutler-Hammer Manufacturing Company, Milwaukee, Wis.



Bulletin 9117 Starter with front cover removed showing contactors, duplex relay and low-voltage coil.

The Bulletin 9117 starter has, besides a low voltage release, a duplex time limit overload relay which is a complete unit in itself. The design of this overload movement is such that it does not open the circuit of the low-voltage coil on a high initial inrush of current nor on a momentary overload, but it will not permit a harmful overload to be maintained. This condition is obtained by retarding two moving plungers in oil dash pots. The plungers, which are actuated by two operating coils, trip a single contact making device, thus opening the motor circuit. At the same time the force of each plunger must overcome an adjustable weight which may be set at various positions along a lever arm, depending upon the amount of current desired to operate the plunger. By turning an adjusting screw the flow of oil around the plunger head may be regulated.

To start the motor, the operator moves the starter handle to the "up" position. This connects the motor to the line and brings into position an interlock which prevents opening the cover of the case. To stop, the operator simply moves the lever back to the stop position, which opens the circuit with a quick break and removes the interlocking bar. The starter is made with either three or four poles for use with standard squirrel cage motors from 3 to 15 hp., and with high torque motors of the "internal starter" type from 7½ to 25 hp. where the line voltage does not exceed 550 volts.

Lowering the panel of the Bulletin 9118 Starter deadens the fuses and makes them accessible for renewal. The switch cannot be closed while the panel is lowered.

The starter known as Bulletin 9118 is adapted for those motors which cannot be connected directly to the line without resulting in a dangerously large starting current. One step of resistance is provided in each of three phases during starting, allowing the motor 60% line voltage and an inrush of approximately three times full load current. By using another set of terminals the resistor is decreased to give approximately 75% line voltage, and 3½ to 4 times normal current. The low-voltage protection coil automatically returns the switch to the "off" position upon failure of voltage.

The motor is started by raising the handle to the starting position, which closes the switch. The handle is held there until the motor has reached full speed. Releasing the handle causes the switch contacts to slide into the running contacts, without opening the motor circuit. The fuses are not in the motor circuit until the switch is in the running position. Therefore, they do not carry the large starting current, and need be of no greater capacity than proper protection demands. This starter is designed for starting standard polyphase squirrel cage motors of from 1 to 10 hp. on any commercial voltage not exceeding 550 volts. The starter can be furnished with resistors suitable for two-phase, four-wire circuits, in which case an additional knife switch is required to entirely disconnect the motor.

Both types of starters are completely enclosed and are so designed that it is impossible to touch any live parts, either while operating or while renewing fuses and making adjustments. Contact posts and figures are of standard C-H construction used in the heavy drum controller, easily inspected and renewed. The enclosing cases are arranged for conduit wiring.

UTILITY IRONING SET

Distributors of electric appliances will undoubtedly be interested in an attractive utility set put on the market by the Hotpoint division of the Edison Electric Appliance Company, Chicago, Ill.

It consists of a three-pound iron, folding curling iron, collapsible stand for inverting the iron while heating the curling iron or when using as a small cooking stove. Liberal cord and plug included. The iron differs only from the standard Hotpoint Iron in the following respects: It has no attached stand; has two holes in the rear for insertion of curling irons—thus two irons may be heated at the same time. When the stand supplied for inverting the iron is not used for that purpose, it serves as an ordinary iron stand. The set

Convenient set for traveling

fits into a very cleverly constructed folding box consisting of four wooden sides, hinged with cloth, constructed to fold up in such a way as to provide closed ends. When folded in the box form it presents a very compact, neat appearance. The size when folded is approximately 8 by 5 by 4.

The big feature about this box is that when unfolded it provides a very handy ironing board, surface 16 by 8 in., on which any little pressing job may be accomplished by the user. Thus the inconvenience usually experienced by travelers not having suitable ironing surface will be done away with.

Because the set occupies so little space in traveling bag, suitcase or trunk, it will without doubt meet with approval from travelers.

NEW ELECTRICAL DEVELOPMENTS

(The opening of several new industrial plants in the Northwest calls for extensive electrical installations; in the Pacific Central district various power plant extensions are under way and big pumping projects planned; in the Southwest and Intermountain districts new regions are opening up and demand a power supply. Electrical items from the Pan-Pacific area indicate the activity along this line which is characteristic of the after-the-war period.—The Editor.)

THE PACIFIC NORTHWEST

LAKE CITY, WASH.—Lake City has filed a petition for the purpose of extending a water main to this addition.

VANCOUVER, WASH.—The matter of providing the city with an up-to-date lighting system is being considered.

SEATTLE, WASH.—The Seattle Street Railway Employes' Association has been organized by E. H. Davy and M. P. Murray.

SEATTLE, WASH.—The Port of Seattle Commission has decided not to purchase at this time the $90,000 gantry crane for which bids were opened some time ago.

ASTORIA, ORE. — The McCartney Electric Company of this place received the contract for electric wiring of sections 1, 5 and 6 of the Port warehouse at $3,344.

YOUNG'S BAY, ORE.—The Pacific Power & Light Company has let contracts for the immediate building of a million-dollar power, light & gas plant on a 15-acre tract here.

ALBANY, ORE.—W. F. Burman, E. C. Cline and C. E. Bryant have incorporated the Electric Store of Albany with a capital stock of $10,000, to handle and deal in everything electrical.

CHEHALIS, WASH.—The city commission has passed a resolution calling for the installation of new standard street lights, about 90 concrete poles with 400-candle power lights on the business streets.

EVERETT, WASH.—The Commercial Club is discussing a better lighting system for the city. It is planned to create an improvement district in the down town section for installing a cluster light system.

EVERETT, WASH.—On November 15th an election will be held by the voters of this city to decide whether or not they desire a municipal power plant and to ask for sufficient bond issue to cover the proposal.

CHEHALIS, WASH.—The city of Chehalis will install sixty boulevard, 400-watt lamp posts on Market street and the Pacific Highway, within a short time, the North Coast Power Company furnishing the energy.

MARSHFIELD, ORE.—The Mountain States Power Company has closed a contract for furnishing 200 hp. electric energy to the Western Lumber & Manufacturing Company, which plant expects to start double shift operations.

LITTELL, WASH. — The Snow Lumber & Shingle Company at Littell, Wash., has recently connected 290-hp. in motors to the North Coast Power Company system, driving planers and other wood-working machinery.

CHEHALIS, WASH.—The Chehalis Mill Co. has installed 75 hp. in motors to drive woodworking machinery and will install an additional 150 hp. in a short time. These motors are connected to the North Coast Power Company's system.

KELSO, WASH.—The North Coast Power Co. is raising its line voltage between its Kalama Station and Kelso, Washington, from 6600-volt to 22,500, and later it will be raised to 45,000 to conform to the voltages of the balance of the system.

SEATTLE, WASH.—A petition for disincorporation has been filed in the superior court by the Master Electric Company of Seattle. The petition sets forth that all outstanding obligations have been satisfied and a hearing on the petition is to be held December 22.

SEATTLE, WASH. — H. Bittman, structural engineer, Securities Building, has been authorized to prepare plans for the construction of a one-story masonry building with concrete floors and basement for the Eveready Electric Service Company at East Pine street and Nagle Place, at an estimated cost of about $30,000.

TACOMA, WASH.—Construction of another building to house the distributing plant of the Tacoma Gas Company, destroyed in a recent explosion and fire, has been started. The foundation for a new compressor, larger than the one in use, has already been laid.

COWLITZ, WASH.—Reclamation District No. 5, Cowlitz county, Wash., has made application to the North Coast Power Company to furnish electric energy to drive 350-hp. in motors to pump water from 9,000 acres of Columbia River bottom lands near Woodland, Wash.

SPOKANE, WASH.—An estimate made by City Engineer E. B. Hussey to the city commissioners showed that it will cost Walla Walla $500,000 to own a perfectly reliable water system. The proposed reservoir will cost $375,630, including the engineering water shed or else the creation of a main pipe line a mile above Tiger Canyon will cost approximately $91,963.

SPOKANE, WASH.—Electric operation of the 207 miles of the Milwaukee railroad between Othello and the coast will start about November 1, if necessary motors and substation equipment are delivered in time, it has been announced. The train crews now are being broken in to the work and are said to be enthusiastic over the performance of electric locomotives on this division.

SEATTLE, WASH.—The Rothert Process Steel Company, 622 Harriman street, is installing a two-ton capacity alloy furnace to make its own alloys, the same to be operated by electricity as are its other furnaces. The company is now turning out two to three tons per day of high speed steel and the output is to be steadily increased. Installation of a small rolling mill is under consideration.

SEATTLE, WASH.—Erection of a new steel plant at Seattle is to begin within the next six weeks. The officers of the Western Rolling Mill Corporation make this announcement. The size of the plant will be 700 by 60 feet. It will have three open hearth furnaces of 50 tons capacity each and two continuous furnaces. It is understood that the company will put in its own power plant and will install one experimental electric furnace. It is probable that Wellman-Seaver-Morgan Company of Cleveland, Ohio, will install the entire equipment. Warner & Porter, financial brokers of Seattle, are handling the financial end of the matter. Offices are maintained at 401-403 Pacific Building, Seattle.

ASTORIA, ORE. — Announcement has been made that extensive developments are to be made by the Crown-Willamette Paper Company of its holdings in the Youngs River Falls section of the Youngs River district, a few miles above Astoria. The development plans include the erection of a 60-foot dam in connection with a plan to electrically harness Youngs River falls. Power will be furnished for an electric plant which will be the center of a number of industries to be located in that vicinity. The company announces a proposal to erect a grinding and pulp mill with a capacity of 100 tons of paper pulp daily. The work of clearing the site for the dam has been completed.

THE PACIFIC CENTRAL DISTRICT

OILDALE, CAL.—A mass meeting of Oildale residents was held to consider plans for the organization of a water company, to be composed of the water users of the community.

VALLEJO, CAL.—Before the work on the extension of the Pacific Gas & Electric gas plant in Maryland street is completed, the company will spend many thousands of dollars on the project. The Glover property recently purchased will be cleared of the present buildings in the near future, and a huge gas container will be erected.

RIO VISTA, CAL.—Specifications are being made by the Great Western Power Company for the construction of five miles of line to supply the territory adjacent to the Elkhorn Slough side of the Holland Land Company's holding. The line will be constructed from the present pumping plant of Reclamation District 999, south to a point near the present ferry to Merritt Island.

SONORA, CAL.—The Groveland and Big Oak Flat section are planning an irrigation district. The proposition is to buy the Golden Rock ditch and water rights.

MERCED, CAL.—The board of supervisors has called an election for the Merced Irrigation District of 173,000 acres. The project is to cost about $6,000,000.

WALNUT CREEK, CAL.—Bids for the construction of two culverts between Walnut Creek and Danville were received but the Board of Supervisors rejected all offers and authorized the county surveyor to start work at once.

VALLEJO, CAL.—Mare Island is to win a second radio station for this district. This was announced officially and it was stated that three huge towers will be erected on the beach on the western shores of Mare Island at a cost of approximately $150,000.

CHICO, CAL.—Tentative boundaries were defined for a drainage district that is to embrace approximately 180,000 acres of land along Butte Creek at a meeting of representatives of landowners held here. It is expected that the construction of the district will cost $85,000.

OROVILLE, CAL.—The Board of Supervisors has set Thursday, November 6, as the election day for both Oroville, Wyandotte and the Honcut-Yuba irrigation districts. At this time the voters will have an opportunity of sounding their final opinions as to the foundation of the districts.

FRESNO, CAL.—Two districts which desire to become part of the Pine Flat Conservation district have filed their petitions for organization with the State Irrigation Board. The San Jose district containing 25,000 acres is one, and the Burroughs Irrigation District containing 40,000 acres is the other.

OAKLAND, CAL.—The Oakland, Antioch and Eastern Railway has obtained from the Commission authority to construct a highway grade crossing over the county road between Concord and Bay Point in connection with the track it is to build connecting its line with a branch of the Bay Point and Clayton railroad.

SAN FRANCISCO, CAL.—The Pacific Electric Manufacturing Company has been incorporated, to manufacture and sell electric switches, etc. The capital stock is $50,000; 500 shares at $100 each; amount subscribed, $50,000. Subscribers: Joseph S. Thompson, 46 shares; James A. Thompson, 20 shares; Edward F. Sixtus, 20 shares.

WOODLAND, CAL.—The Pacific Gas & Electric Company plans to extend its gas mains in the residential section of Woodland to meet the demand for fuel and heat following the increasing population of the expanding residential section. A crew of men is now piping First street, preparatory to paving by Clark and Henery.

FRESNO, CAL.—W. P. Boone, member of the State Irrigation Commission, and connected with the Pine Flat project, has gone to San Francisco to complete arrangements with the owners of lands in the Mendota, San Jose and Burrel districts of Fresno county to secure their entrance into the super-district under the Pine Flat project.

CHICO, CAL.—Engineers are reported to be on the ground, making the preliminary surveys for placing a concrete dam on the middle Feather above Hartman Bar, and fluming the water for a considerable distance around the hillside. J. Miller, who had charge of the operations at Robinson mine near Granite Basin, is said to have financed the project.

RICHMOND, CAL.—The decision reached by the conference of merchants, the city council and Manager George N. Rooker of the Western States Gas & Electric Company to have electroliers installed in all the Richmond business section will result in one of the most necessary improvements of the year. Ornamental poles and brilliant lighting will do much to enhance the appearance of the business section.

MEADOW VALLEY, CAL.—Under supervision of H. J. Greenbower, extensive development work is being carried on at the Greenbower mine, near Mount Ararat. Twenty men are busy building a wagon road around the mountain and it is proposed to build a debris dam that will be 35 feet high and 280 feet in length, with a base thickness of 85 feet. A ditch and pipe line are also to be constructed.

RICHMOND, CAL.—Reported intention of the owners of the $3,000,000 Winehaven plant to turn it into a great warehousing project is borne out by the fact that concrete wharves are now being constructed at the plant. The big buildings are on the city's outer deep water front, are connected with the Richmond Belt railroad and have their own electric switching system with a transformer house.

MADERA, CAL.—The preliminary work for the formation of the Madera Irrigation District is rapidly being carried to completion. The district will comprise some 370,000 acres of the plains land in Madera county, and most of the water is to be secured by damming the San Joaquin river at a point one mile west of Friant and storing the water in the bed of the river. The cost of the project will be approximately $15,000,000.

SACRAMENTO, CAL.—State Engineer W. F. McClure has recommended the sale of a supplementary bond issue of $140,000 to be used for the purpose of completing the Paradise Irrigating District in Butte county. The money thus raised by the sale of bonds will be used for the purpose of preventing waste of water now lost through some of the many ditches of the district. The building of extra flood gates and other work is also contemplated.

YUBA CITY, CAL.—A meeting of land owners was held recently at Horkey's Corners, nine miles west of Yuba City, for the purpose of forming a rice irrigation district. The rice growers plan to secure water for irrigation purposes from the Sutter-Butte Canal Company by way of the Live Oak drainage ditch. The growers plan to lay pipes to carry the waste water into the Sutter By-Pass during the summer months, and to install pumps for the purpose of running water during the winter.

SAN FRANCISCO, CAL.—A campaign is to be launched by the Board of Supervisors to "educate" the people of San Francisco to the point where they will readily accept another bond issue for the completion of the Hetch Hetchy water and power project. This became known at a meeting of the Board, when it was freely confessed that the $45,000,000 voted by the people in 1910 will be inadequate to complete the system. Supervisor Andrew J. Gallagher presented a resolution urging the Public Utilities Committee to employ motion pictures in the education of the public.

RIO VISTA, CAL.—Plans are practically completed for the erection of a power line by the Great Western Power Company to serve the town of Franklin, which lies about ten miles south of Sacramento. The main line tap and the distributing lines about the town will cover about 12 miles. The cost of construction will be about $20,000. A 22,000-volt line will be built from Hood, through which the present main line passes, to the town, where a substation will be erected for the distribution of the current. It is estimated that the load available will be about 500 horsepower. Most of the power will be used for lighting, cooking and pumping.

MERCED, CAL.—Another grade in the long fight for the Merced irrigation district has been made in the form of official endorsement of the project by the State Engineer, whose report has been received by the board of supervisors. In addition to the favorable report on the Merced district, the engineer denied the feasibility of the smaller districts within the proposed Merced district. These five smaller projects are known as the Plainsburg, Bloss, Nairn, Winton and Atwater districts, and were alleged, at the time their formation was proposed, to be a move on the part of the opposition forces of the big district. It is expected now that the election for the formation of the Merced district will be held some time early in October.

VALLEJO, CAL.—Water shortages at Fairfield, Suisun, Benicia and this city will be cared for in the future through the purchase of supplies from the Government if the plan decided upon at a conference of representatives of those cities and Mare Island officers is carried out. Commander L. M. Cox, public works officer at Mare Island, does not favor the plan of bringing water from Gordon Valley, because of the limitations of any reserve. The plan proposed by him is to secure fresh water from the Sacramento river at a point above Rio Vista, pump it through a thirty-four-inch wooden stave pipe to the present Government station at Creston, and then bring it through the Vallejo pipe to this city. Water can also be furnished to the other towns concerned. The project is to cost $2,000,000, and an appropriation from Congress will be requested.

THE PACIFIC SOUTHWEST

SAN DIEGO, CAL.—City Engineer Rhodes has begun work on figuring estimates for the Barrett Dam.

LANCASTER, CAL.—A contract has been awarded Mr. Gibson of this city for the installation of cement pipe for irrigation purposes. Work will be commenced immediately.

PHOENIX, ARIZ.—Sealed bids will be received for making improvements according to plans and specifications for the improvement of certain portions of the Salt River Valley Canal.

REDLANDS, CAL.—The Pacific Electric Railway will do considerable track work, alterations to car barns, etc., to make ready for the running of the big steel cars from Los Angeles, which will take place by Jan. 1st at the latest.

RIVERSIDE, CAL.—The Riverside Water Co. has purchased land at Indiana Avenue and Fillmore Street, where an equalizing basin will be installed, which will impound 2,000 inches of water for 24 hours and afford a uniform flow of water delivered to 2,000 acres. The dam will be constructed across the Arroyo at the junction of Indiana and Fillmore—400 ft. long and 25 ft. high.

WICKENBURG, ARIZ.—A new project to irrigate 20,000 acres of land has been reported favorably to the state engineer. The land is located west of Hot Springs Junction and the dam location for storage of Hassayampa surplus waters is 20 miles above Wickenburg. The storage dam proposed is to be located on the site of the old Walnut Dam and is to be 163 ft. high and 675 ft. long. The reservoir will cover 1,400 acres.

THE INTER-MOUNTAIN DISTRICT

DELTA, UTAH.—The Deseret Power Company officials are negotiating with the Telluride Power Company for the purchase of the former company's plant and distribution system.

LOGAN, UTAH.—Work has been started on the White Way lighting district for this city. The work is being done by the Intermountain Electric Company of Salt Lake City, who were the lowest bidders.

LEVAN, UTAH.—This town is seriously considering the purchase of electric power from the town of Fountain Green, the surplus power being available on account of a recent addition to the Fountain Green plant.

BOISE, IDA.—Application of the Utah Power & Light Company to extend their service to the towns of Dayton, Clifton and Oxford, in Bannock and Franklin counties, was received recently by the Idaho Public Utilities Commission.

CARSON CITY, NEV.—P. A. Simon of Mina has made application to the state engineer for permission to use the water of East Walker river for the generation of electric power. It is planned to create 6000 horsepower by means of an impounding concrete and rock dam to cost approximately $600,000.

MANHATTAN, NEV.—Arthur Cox, former district superintendent for the Nevada-California Power Company, but now contracting for that corporation, has been awarded the contract to construct the power line from Manhattan to Tybo for the use of the Louisiana Consolidated and other companies in that section. The amount of the contract is in the neighborhood of $100,000.

KALISPELL, MONT.—There is a shortage of buildings for business and residential purposes. The Mountain States Power Company is being requested to make extensions in outlying territory and a number of electric ranges are being placed. The company is also receiving a large number of inquiries for power for irrigation purposes and recently closed two contracts for two such installations, totaling 65-hp. in motors. Four additional electric ranges have just been placed.

BOISE, IDA.—An irrigation congress of delegates from 12 Western states has been called by Governor D. W. Davis, to meet Friday and Saturday, Nov. 21 and 22, at Salt Lake City. The congress is expected to develop into an amalgamation of the Western states to promote the development of unused water resources and to present to Congress the West's peculiar irrigation needs in the way of national legislation. It is probable that each state will be represented by ten delegates.

CARSON CITY, NEV.—J. F. Shaughnessy, chairman of the Public Service Commission, has announced that the commission will immediately order the Reno Traction Company to provide its Reno-Sparks line with up-to-date equipment. The company will also be directed to improve the roadbed and maintain first-class service. The commission has decided that the Reno city lines are not under its control, and that it will be necessary to amend the franchise of the Reno Traction Company to permit improvement orders issued by the commission to be put into effect. The Reno city council will be so advised.

THE PAN-PACIFIC

CHANARAL, CHILE.—The Andes Copper Mining Company has a smelting plant under construction, and will build a power plant at Chanaral.

TOKYO, JAPAN.—An air postal service is to be inaugurated between Tokyo and Osaka. The Imperial Aviation Society, a semi-official organization for the promotion of aviation, and the

Department of Communications are to cooperate in maintaining this service.

LIMA, PERU.—According to recent advices, Lima is to have an amusement park similar to Luna Park, New York. Extensive electrical illumination is planned, and there will be many modern amusement devices.

SYDNEY, AUSTRALIA.—Consul General J. J. Brittain of Sydney reports that the farmers in New South Wales are endeavoring to make use of the most up-to-date machinery on their lands, American machinery being much in evidence.

FUKUOKA, JAPAN.—The Nippon Electrical Sheet Iron Company, incorporated some months ago with a capital stock of $1,000,000, is the first firm in the country to be engaged in the manufacture of electrical sheet iron.

AICHI, JAPAN.—The central part of Japan, comprising Aichi, Gifu, Nagano, Toyama, Ishikawa, Fukui, and two other prefectures, is the main district for the origination of hydroelectric power, and numerous companies have applied for the privilege of utilizing the swift flowing rivers in this part of Japan.

CELEBES, DUTCH EAST INDIES. — Some time ago reports were received relating the discovery of large iron ore deposits in Celebes, Dutch East Indies. These reports have been confirmed by government investigations, and the working of the fields is to be done by electricity if sufficient water power is available.

TIENTSIN, CHINA.—The China Mongolia Export Company, Inc., Tientsin, an American concern, has recently commenced work on a new cold storage, meat packing, and egg albumen plant. The machinery to be installed in the new plant includes one steam turbine with one 50-kilowatt electric generator.

MEXICO CITY, MEXICO.—The company operating the electric railway system of Mexico City and suburbs has made a contract for the completion of the line connecting the capital with the City of Puebla. Owing to the difficult nature of the country to be traversed it is not expected that the work will be completed until 1926.

HARBIN, CHINA.—The Chinese Eastern Railway is shortly to establish an automatic telephone exchange of 3,000 instruments here, the equipment having for some time been ordered and an expert engineer engaged to install the system. In this connection it is noted that Manila's new automatic system will be in operation soon.

IGUAZU, ARGENTINA. — The hydroelectric development of the great falls of Iguazu is to be undertaken. The Argentina Government has arranged for preliminary surveys to be made this year by a commission especially appointed for this purpose. The falls are very large and should prove a factor in the industrial growth of the country.

SHANGHAI, CHINA.—The Shanghai Tramways Co. (British) has decided to build its own tramway cars. The company has acquired land, on which it will build a factory. Orders for the machinery have not as yet been placed. The company proposes to begin with the construction of 15 cars, and seven cars for use in connection with its railless operations.

TAIHOKU, TAIWAN.—The first general meeting of the Taiwan Electric Power Co. (Ltd.) was held in Taihoku, Taiwan, recently, when the corporation elected its officers. Work on this company's plant, which is to be located at Lake Candidiidius, is to begin at once, and all inquiries regarding the possibility of furnishing materials should be addressed direct to the company at Taihoku, Taiwan.

GOOCHOW, CHINA. — There was recently formed in Foochow, China, an association for the promotion of Chinese industrial interests. Several members of this organization have already raised $75,000 for the establishment of an iron foundry at Foochow. It is planned to produce small iron household, agricultural and other utensils, machine parts and other iron products of a simple nature.

GATUN, PANAMA.—The installation of lighting in the new cold storage plant at Mount Hope has been carried to 98 per cent completion. Fifteen motors have been placed in service. Work has been continued on the power plant equipment at Coco Solo, and the exterior electrical work on the seaplane hangar was 95 per cent complete at the end of July.

SHANGHAI, CHINA.—The agitation in favor of Chinese made goods is producing a great demand for cotton goods and a number of the principal mills in the vicinity of Shanghai, Tientsin and other centers are greatly increasing their output. Electrical machinery and other modern equipment is being installed and it is reported that American firms are receiving a goodly share of this new business.

TAMPA, MEXICO.—The National Norwegian Company has secured a concession from the Mexican Government for the construction of an electric railway line connecting Tampico and Tuxpan and with branches to various important places in that section. It is said that the new line will be inaugurated the first of the coming year and will provide transportation facilities for a region which has been neglected in the past.

TOKYO, JAPAN.—While before the war the commerce between Japan and the Argentine Republic hardly reached $250,000 annually, last year it exceeded $15,000,000. It is said that the recently created Japanese Legation in Buenos Aires is doing much to arouse interest in commercial circles in the merchandise of Japan and also to provide a market in Japan for such Argentine products as can be disposed of there to advantage.

BUENOS AIRES, ARGENTINA. — Buenos Aires is to have one of the largest wireless stations in the world, if present plans materialize. The Marconi Company has commenced work on a station which is to have a radius of several thousand miles. The company is planning to transmit commercial messages between New York and Buenos Aires. Another company is considering the construction of wireless stations to unite Argentina and Spain.

SHANGHAI, CHINA.—There has been formed in Shanghai a new chamber of commerce which, upon its organization, enrolled 2,700 Chinese firms, and to this list it expects to add 10,000 more members. While these organizations, which are composed of small retail firms, give the impression of being unions of shop keepers rather than chambers of commerce in the western sense, their influence on political and commercial life is nevertheless likely to be very great.

TOKYO, JAPAN.—The street railway department of Tokyo has decided to raise the wages of conductors and motormen and other workingmen. The decision was approved by the mayor and the raise was effective August 1st. The raise was made to meet the advanced cost of living. Five thousand six hundred conductors and motormen will have their wages raised by sixty per cent, and other workingmen numbering two thousand nine hundred by from sixty to a hundred per cent.

BATAVIA, JAVA.—An engineering congress composed of engineers in countries on the Pacific and Indian oceans will be held here in May, 1920, for the purpose of stimulating the technical development of eastern Asia. It is also hoped that the congress will result in the improvement and extension of trade routes in the east. Among various subjects to be discussed are harbors, communications, town planning, architecture and industries. The Dutch and English languages will both be used.

MELBOURNE, AUSTRALIA. — A modern plant is to be erected in the harbor of Melbourne for the handling of coal, which is to replace the present primitive method of hand-filled baskets, which are hoisted out of the steamers' holds by winches. The plant when completed will consist of four electrical hoists with grab buckets, which pick up four or five tons of coal at a time and deliver it to mechanically-operated conveyers, which in turn carry it to great storage bins of 30,000-tons capacity, from which the coal is sent in chutes to coal trucks.

SYDNEY, AUSTRALIA.—The following comparative figures showing the increase in the business of the city council's electricity department between May, 1914, and May, 1919, were recently submitted to the council: On May 31, 1914, number of consumers, 10,280; 1919, 28,830; increase, 19,540, or 180 per cent; the units sold, 1914, 3,331,686; 1919, 6,993,534; increase, 3,661,848, or 110 per cent; the average price received for all units sold in 1914 was 1.88d.; 1918, 1.72d., a decrease of 0.16d.

SHANGHAI, CHINA.—The British Marconi interests and the Chinese Government have perfected a cooperative undertaking for the development of wireless communications in the Far East known as the "Chinese National Wireless Company." The capital is fixed at approximately $3,500,000, one million being paid up. The Chinese Government owns one-half of the 700,000 shares, at the end of twenty years being privileged to sell to the Marconi interests or buy the latter out. The new company promises to be an excellent investment, as it will participate in the general world system of the Marconi Wireless Telegraph Company, Ltd., both operating stations and installing equipment.

SYDNEY, AUSTRALIA. — Enterprises involving the expenditure of large sums of money are being considered, such as a subway in the city of Sydney, substituting electricity for steam on the suburban railways, building of a bridge across the bay, and branch railway lines throughout the country for the purpose of opening up land to settlers (for which New South Wales Government contemplates the expenditure of $14,599,500 on the extension of railway lines), irrigation proposition on the Murray River, also the improvement of highways of Sydney, and the development of water power. Increased indebtedness necessary for these industries in view of the war expenditures must be seriously considered.

MURRAY RIVER, AUSTRALIA.—A dam for irrigation purposes is being built on the Murray River where the Mitta Mitta River intersects the Murray, known as the Mitta Mitta Dam. The objective is the storage of 1,000,000 acre-feet, equivalent to 43,560,000,000 cubic feet, or 272,250,000,000 gallons of water. The dam will have a height of 94 feet from the bed of the river, so that when the reservoir is full the submerged area will be approximately 16,820 acres on the Murray River and on the Mitta Mitta River 13,482 acres, making a total surface area of the full reservoir of 30,300 acres. It is estimated that the cost will be approximately $6,099,000, which cost will be shared by the States of New South Wales, Victoria, and South Australia, as well as the Commonwealth. This dam, when completed, will bring under cultivation, through irrigation, a large area of fertile land.

AUCKLAND, NEW ZEALAND.—The Whangarei Harbor Board has adopted a scheme for general harbor improvements, including the extension of wharf, dredging, etc., at Whangarei, an important center north of Auckland, involving the expenditure of $562,567 to be spread over six years. A loan is to be raised for this amount at 6 per cent. It is thought the improvement of this harbor will increase the population of the district at the rate of 6 per cent per annum. It is proposed to purchase a new dredging plant, cranes, wharf fixtures, etc. The dredging and erection of a concrete wharf 500 feet long, etc., will cost $330,922, and railway extension $230,972. Hand in hand with these matters a plan is proposed to reclaim 1,000 acres for commercial sites, which land will be owned by the Whangarei Harbor Board. Whangarei is situated on the east coast of the North Island, 81 miles north of Auckland by steamer, and when the port is improved this town will be the outlet for the district north of Auckland, and large quantities of coal, butter, cheese, and frozen mutton will be shipped from that port.

Water Rights apparently are not all they are 'cracked up' to be, when the intelligence of the Young Idea gets to work. This story is guaranteed accurate:

One of the keepers of a large Irish estate discovered a small boy fishing in one of the streams.

"You musn't fish here," he told him; "these waters belong to his lordship."

"Do they?" said the boy. "I didn't know that." And promptly laying aside his rod he took up a book and commenced reading.

The keeper therefore departed, but returning the same way about an hour or so afterward, he found that the boy had started fishing again.

"Didn't I tell you that this water belonged to his lordship?" he roared.

"Why, you told me that an hour ago," retorted the youngster. "Surely the whole river don't belong to him; his share went by long ago."

* * *

Educating the public to a familiarity with electricity will bring certain disadvantages when the goal is attained, according to a pessimistic Western public utility official. He has lurid visions of his bill-collectors being met at the door by too-fully-informed housewives, and struck dumb with something like this:

"Say, I didn't get my full amperage last month and I didn't use within half a pint of the kilowatt-hours that you've got me charged with. Then I think it's a measly trick, your slipping me a few weak kilowatts off the peak of the load and nearly blowing out my fuses. Then you never delivered me that alternate current on Fridays, when the card club meets at my house, and I explained to your salesman that the direct current doesn't match the polka dot stripes in my curtains and it doesn't fit in with those new jazz records."

* * *

Electrifying the home is responsible for a great deal of jubilation these days. The following joyous chant should inspire similar ones on brooms, coal stoves, wash day, and other unnecessary antiques:

DRIVE ON, ICE MAN, DRIVE ON!
By C. L. Funnell

Chew on, thou husky roughneck, chew!
Or swear or dance or sing:
Our domicile is rid of you,
Your ice—and everything!

No more your massive hoofs shall lay
A trail upon our floor
Of sand and mud and loam and clay;
No more—we said—no more.

Henceforth your flopping robe
Shall flop and rub outside
Our humble halls; and each microbe
You've brought us shall have died.

Knight of the tongs: Gaze up and bow—
Your parting manner don.
Our icebox is electric now.
Drive On, Ice Man, Drive On!

* * *

Out of the depths of bitter experience comes this plaintive psalm—and David himself would probably have forgiven the parody had he owned an automobile instead of a harp:

"The Ford is my car.
I shall not want another.
It maketh me to lie down in wet places.
It spoileth my soul.
It leadeth me into deep waters.
It leadeth me into paths of ridicule for its name's sake.
It prepareth a break-down in the presence of mine enemies.
Yea, though I run through the valley I am towed up the hill.
I fear great evil when it is with me.
Its rods and its engine discomfort me.
It anointeth my face with oil.
Its tank runneth over.
Surely to goodness if this thing follows me all the days of my life, I shall dwell in the house of the insane forever!"

You know the Irishman who said they had wireless telegraphy in the early days of the Celts in Ireland, as proved by the absence of wires? Well, there is equal evidence that there were electrical connections in the Garden of Eden. Just what advantages in the way of household labor-saving devices were in vogue before the invention of household labor are here vividly pictured by one of the employes of the Western Electric Company. What a shame Adam ever left simple gardening to go into the nursery business!